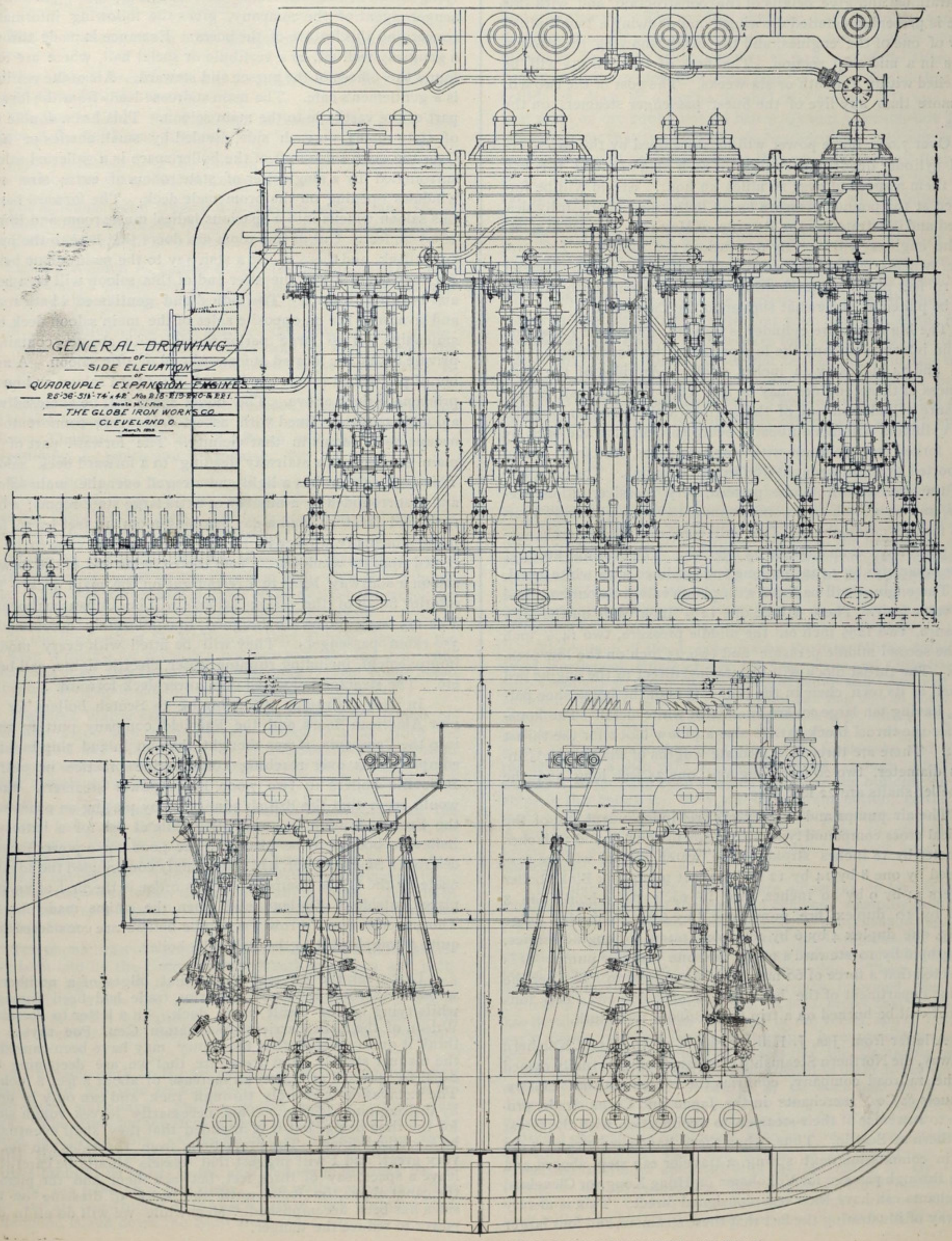
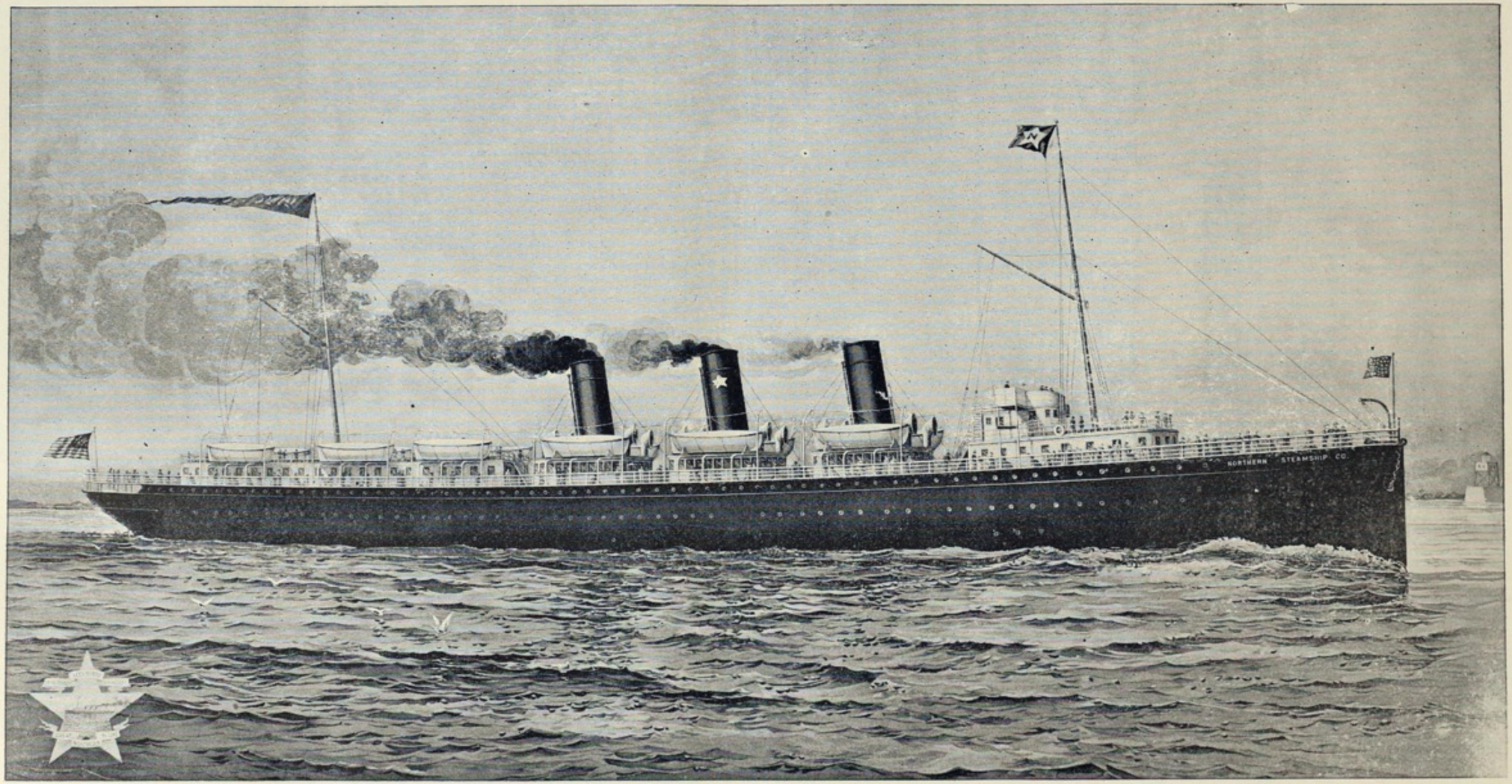
# MARINE REVIEW.

VOL. VIII. CLEVELAND, O., AND CHICAGO, ILL., AUG. 3, 1893. No. 5.


QUADRUPLE EXPANSION ENGINES FOR THE NORTHERN STEAMSHIPS, (See Page 6).




*Supplement to MARINE REVIEW, Cleveland, O., August 3, 1893.*

TWIN-SCREW NORTHERN PASSENGER STEAMSHIP.

## Quadruple Expansion Engines of Northern Steamships.

As the work progresses on the machinery and hulls of the twin screw steel passenger steamers building by the Globe Iron Works Company for the Northern Steamship Company some very interesting details are brought out. Through the courtesy of builders and owners the REVIEW has been enabled to present illustrations and give details of the construction, and with this issue is presented detailed drawings, one showing a longitudinal view of one of the engines, and the other showing the two engines in a mid-ship section. The first of these boats will be launched within a month or six weeks. The cost of the two will be more than any five of the finest passenger steamers on the lakes.

Over 7,000 horse power will be developed by the two overhead cylinder quadruple engines in each steamer, and this will give them a speed of over 20 miles an hour. Steam will be furnished at 195 pounds pressure by 28 Belleville boilers, fully described and illustrated in the REVIEW of May 11. The mean speed of the engines will be 120 revolutions per minute. The propeller wheels will be sectional four-bladed, 13 feet in diameter and 19 feet pitch. The shafting will not extend outboard and will be plated in somewhat similar to the Campania.

The high pressure cylinder is forward, followed by first and second intermediate and the low pressure, the sizes being 25, 36, 51½ and 74 inches by 42 inches stroke. An idea of the massiveness of these engines may be had from the fact that the low pressure cylinder on one of the engines weighs 26,000 pounds. The cylinders will face outboard, being supported at the back by four forked cast columns with slipper guides, the front being supported by eight wrought iron turned columns. The bed-plate is of the well-known Globe pattern, very massive, in four sections, and weighs about 70,000 pounds, having eight large bearings for the crank-shaft. This will consist of four interchangeable parts fixed at an angle of 45 degrees. The bearings are 13¾ inches diameter by 14 inches long and are lined with white metal.

The engines will be fitted with piston valves throughout and Joy valve gear. There will be one 12½ inch valve on the high pressure, two 12½ inch on the middle pressure, two 14½ inch on the second middle pressure and two 25 inch on the low pressure. The thrust block will be attached direct to the engine bed as well as its own chair in the hull. It is of the horse shoe pattern, having ten large collars lined with white metal. The housing for the thrust block carries also a pillow block for the thrust shaft. There are three intermediate lengths of shafting 13½ inches diameter, two 20 feet long and one 25 feet long, and the propeller shafts are 22 feet long.

The air pumps and condensers are independent and of the vertical cross compound type with steam pistons 15 and 30 inches diameter by 18 inches stroke. The water service will be performed by one 8 by 14 by 12 inch ballast pump, six Blake boiler feeders 14 by 9 by 10 inches, two in each stoke-hold, one 8 by 6 by 10 duplex fire pump, one 8 by 6 by 10 duplex bilge pump, one duplex 4 by 6 by 10 cooler pump for engine service, one 4 by 6 by 10 steward's pump and one sanitary pump. It is expected that a force of 60 men will be required to look after the engine department of the boat, and between 800 and 1,000 tons of coal will be burned on a trip from Buffalo to Duluth.

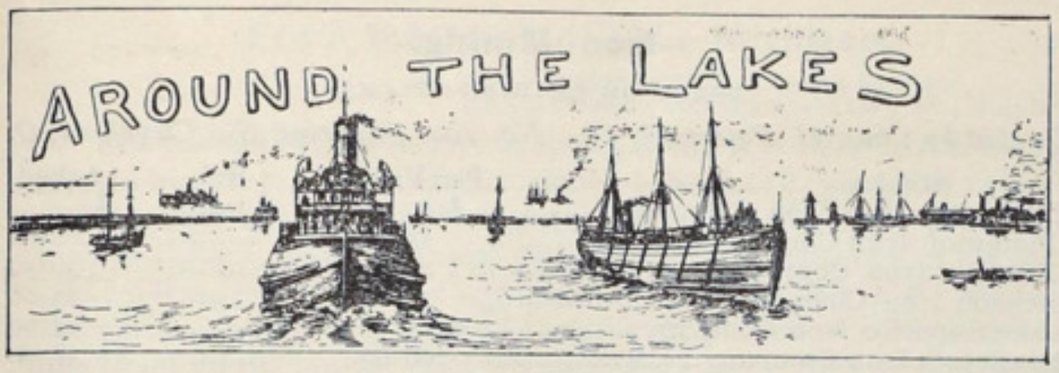
A letter from Jas. J. Hill, president of the Great Northern Railway, the Northern Steamship Company being virtually owned by the railroad company, confirms the statement that Messrs. Samuels & Co., merchants in the Japan and China trade, propose to run some of their steamers to a connection with the Great Northern at Seattle. Thus, when these handsome steamers are put in commission next spring, a traveler can step aboard and take through passage for Yokohama or Hong Kong, or Cleveland merchants can have their teas consigned direct. This is merely by way of illustrating the fact that these steamers, and four larger ones that will be built as soon as these are clear of the yards, are part of a transportation system that will encircle the globe.

No expense is being spared in finishing and furnishing these steamers to make them the equal in point of comfort and elegance to the transatlantic liners. Those who are in position to know say that they will be furnished more handsomely than the famous Long island sound steamers. Mr. T. P. Carpenter, general passenger agent of the company, gives the following information concerning this feature of the boats: Entrance is made through a gangway well aft, to a vestibule or social hall, where are to be found the offices of the purser and steward. Aft of the vestibule is a gentlemen's cafe. The main staircase leads from the forward part of the vestibule to the main saloon. This has a double row of state-rooms on each side, divided by small entries or halls. Over the main saloon aft of the boiler space is a galleried saloon, surrounded by a single tier of state-rooms of extra size, with windows opening on the promenade deck. The forward part of this saloon widens into a spacious ladies' music room and library 26 by 29 feet. Out of this room are doors that lead to the promenade deck, and there is also a stairway to the main saloon below. An open grate fire at the after end of this saloon will be a novel and beautiful feature. The ladies' and gentlemen's bath rooms and lavatories are on opposite sides of the main saloon deck near amidships. Two large parlor rooms, with alcove, containing private baths, are located at forward end of after saloon. A number of parlor bed rooms are located in forward saloon and on the promenade deck above. The boiler space will be enclosed with a double partition lined with asbestos, insuring comfort to the occupants of rooms in that vicinity. The forward part of the main saloon has a stairway leading to a forward deck saloon. This deck saloon has a light and air well over the main saloon, and is surrounded by a number of extra large state-rooms; a bath room and lavatory, and a day smoking-room 12 feet by 26 feet, made unusually attractive by the unobstructed view to be obtained from its windows. From the extreme end of the forward saloon a stairway leads to a restaurant on the main deck. The interior finish of the various saloons will be Cuban mahogany. The 175 state-rooms are designed to comfortably accommodate 350 cabin passengers. They will be fitted with every modern improvement, including running water, electric lights, call bells, etc. The steerage is located on a lower deck forward.

In view of Cramps still clinging to Scotch boilers for the new American liners and the Fairfield company putting them into the Campania, it was thought that an inland ship building company was over reaching conservative practice in putting Belleville boilers in two 7,000 horse power steamers. But it would seem that the British admiralty by placing an order with the French firm of Delaunay, Belleville et Cie for a battery of Belleville boilers to be placed in the 4,000 horse power torpedo destroyer Sharpshooter, had unwittingly commended the advance made by the Globe company. This order is the first of its kind placed outside of England, and when the claims made for the Thorneycroft and Yarrow water tube boilers are considered it is quite a compliment to the Belleville boiler.

---

Last week the REVIEW stated that bilges of a number of wooden vessels in the Lake Superior trade had been damaged while tying to the Sault canal dock. In a letter to President Wilson of the Lake Carriers' Association Gen. Poe says: "I think it quite possible that the injury may have been caused in the manner stated. You are aware that we are deepening the canal to 24.8 feet of water, an increase of about 8 feet 8 inches. The excavation is entirely through rock, and can only be done by drilling and blasting. This necessarily leaves rough sides for the time being, but it is intended that they shall eventually be smoothed down. The projections from the sides can not be very great, and I will suggest that vessels should be careful to leave a space, say of three feet, between them and the piers of the canal above the locks, until the work of dressing off the sides has been accomplished. Meanwhile we will do all in our power to reduce the danger."




The Chequamegon fog horn structure has been destroyed by fire.

The Ashland breakwater will be extended 600 feet into the bay and 1,000 feet shoreward.

The repair bill of the Ira Owen necessitated by going on a boulder at the Sault was $18,000.

Capt. H. A Sisson, in the Clarion and the Gordon Campbell a number of years, died at Conneaut, Ohio.

The schooner John Wesley was released from Grand island near Marquette, where she stranded last fall, and was docked at Port Huron in Dunford & Alverson's new dock

Captain William E. Ladner of the steamer Marshall F. Butters shot himself on his boat going up Lake Michigan. He was a member of the Chicago lodge, Ship Masters' Association.

M. A. Bradley's new steal steamer, the Alva, arrived at Duluth with 3,050 tons of coal. This was her first trip and she had three schooners in tow, the combined cargoes amounting to 7,000 tons.

Donald M. McKensie has succeeded Martin Lynch, the well known superintendent of the Sault canal lock, and R. J. McKeon, Thomas Carrol and R. Rains will take the place of C. Spaulding, R. Smith and J. Hogarth.

The launch of the largest wooden steamer on the lakes, the Thomas Cranage took place at Capt. James Davidson's yard at West Bay City last Saturday. She is 321 feet long and was built under the supervision of Capt. McNeill.

Work on the sunken Fayette Brown has been stopped by a restraining order issued by the Canadian chancellor at Amherstburg. Capt. Hackett makes a small claim against the wreck for work done by the order of the Canadian government.

In the libel snit of H. McMorran, Port Huron, against the tug Kate Williams for causing a pontoon to strike the crib constructed around the Tasmania in September, 1890, Judge Swan confirmed the report giving the libelant $560 damages.

President Walter Groves of the Lake Seamens' Union ordered the 2,500 men in the Chicago branch to do no work for less than $2 a day, This was done in anticipation of an attempt by vessel owners to get union sailors for $1.50 a day. Only sailing vessels are affected.

When the schooner Vance was sunk in a collision with the schooner Law, the Canadian minister of marine instructed the lightkeeper at Pelee to keep a light on one of the Vance's spars as she lies directly in the middle of the passage and is very dangerous to navigation. The lightkeeper says that he cannot place a light on the wreck when the sea is running high. The light is maintained so irregularly that the wreck is a constant menace to vessel men.

Telephone lines connecting Thunder Bay and Middle islands have been laid by the United States Weather bureau and hereafter storm signals will be displayed from life-saving stations on the islands to which the lines run. Communication is free to vessel men, and it is requested that vessels seeking shelter in the lee of either island should avoid the cable when dropping anchor.

At present work on the $6,000,000 Sault lock is progressing rapidly, and 250 men are employed. The masonry will be finished within sixty days. Putting up this masonry is very slow work. The stone for the faces of the wall is brought from Kelly's Island, in a rough state. At the Sault it is finished, four stone planes being kept at work preparing blocks for the walls. The stone is brought on scows to the lock, and eight derricks are in constant use hoisting it into place. The walls are about 10 feet wide, and are constructed at the back part of rock obtained from Drummond island down the Sault river.

## The Lake Freight Situation.

If owners of the business fleet would only get together and agree to lay up for 30 or 40 days, owners of boats having contracts would repudiate them, so that there would be no movement whatever, why there might be some hope, but such an agreement is about as probable as the owners getting together and dividing their earnings, share and share for the fortunate and unfortunate. The gradual shutting down of mines, and the decrease of stock piles give no hope in iron ore, a meagre supply of coal at 30 and 40 cents is nearly as bad, and while there is a rumor of Chicago elevators being emptied it was stated that this could be done at a cent a bushel all around. It was said that rates on ore could not go below 45 and 50 cents, but there is a suspicion that the 45-cent rate has been cut. Except in the cases of a few of the largest boats that are furnished all they can carry, business at these rates is done at a loss. Just how long the Jack-o-lantern of a possible improvement will be followed is hard to tell.

Several gentlemen were interviewed as to the panic of 1873 when rates went from $3.00 or $4.00 down to $1.00, but when the recovery came it was to a prosperous and healthy condition. The establishment that was the nucleus of two lake shipbuilding concerns was cleared of debt in that year, and one of the most prosperous ship owners on the lakes built a new boat and made money that year. But all agree that the conditions in lake trade were not so hopeless then as now, and that the problem before owners at present is unparalleled. The consummation that is to be devoutly hoped for is that "every other owner will lay up his boats."

## In General.

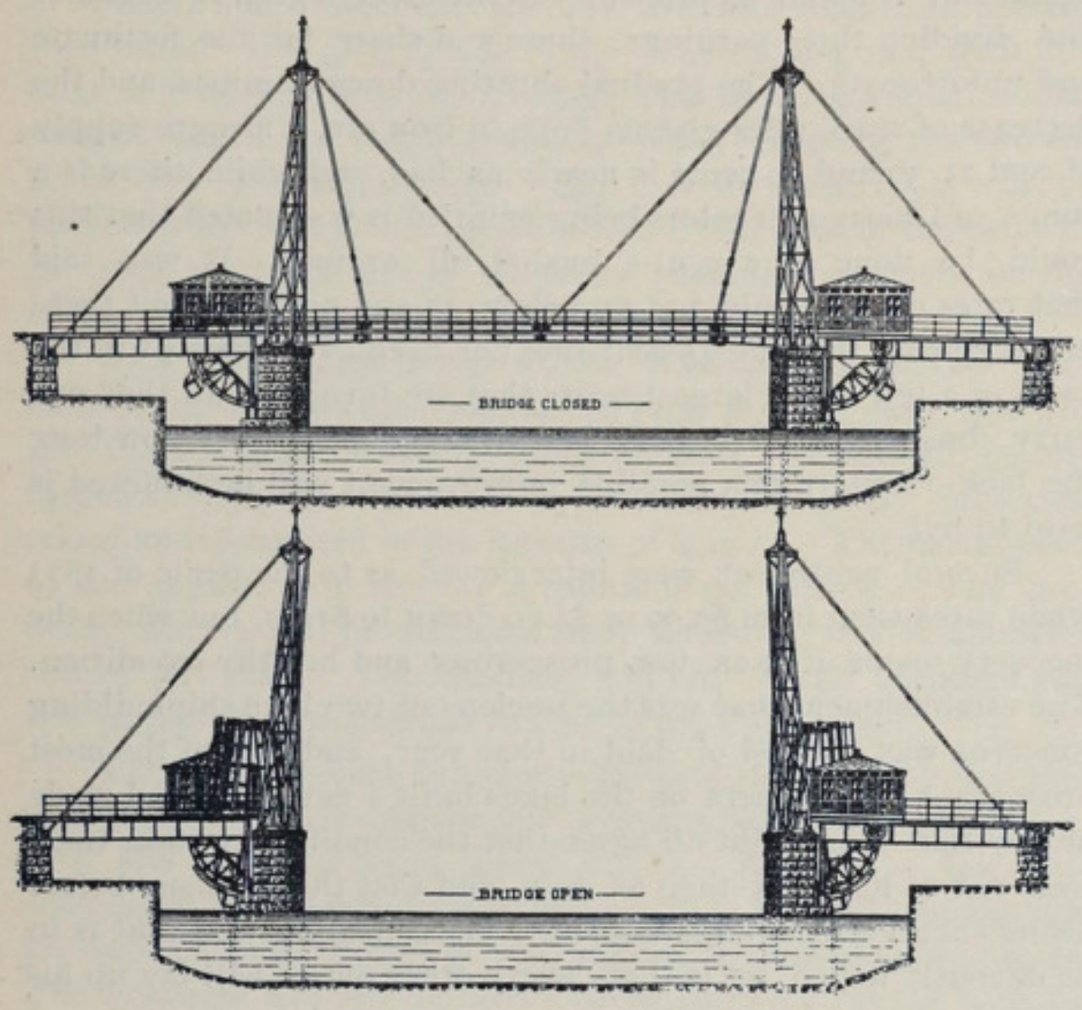
To prove that the Victoria's boilers did not explode Fairplay suggests the following experiment: When a kettle is about half full of boiling water plunge it suddenly into a tub of cold water; ebullition will still continue, owing to the formation of a partial vacuum, and as everyone knows water will boil at a lower temperature in a vacuum. In a minute or two ebullition will cease, withdraw the kettle and try to take off the lid—you will find that this requires some force—there is in fact, a vacuum inside the kettle and consequently a pressure outside it,

The launch of the Appotomax by Furness, Withy & Co., of West Hartlepool, England, for the Chespeake and Ohio Steamship Company to run between Newport News and Liverpool and London, doesn't look as if the American flag was to cover the sea at once. This boat and six duplicates to be built at Hartlepool and on the Clyde are to carry the products of the southern states to England and as the owner of the Chespeake and Ohio railroad owns a ship yard at Newport News, enough American capital should have been enlisted to insure the building of the ships in this country. They will carry grain, cotton, cattle and coal, and some room has been given to passengers' quarters. A number of steel plates 32 feet long were used in plating the vessel and at the mid-ship section plates 60 feet long were worked in.

Fairplay says, "that rumours are afloat as to Mr. White's sudden departure from the Fairfield company's employ many of which are quite irrevelant, but the general concensus of opinion seems to be that it was connected with the Campania, for which vessel Mr. White, it is said, has been held responsible for supposed defects in the design and construction. There may be something in that, but if I am correctly informed, the real trouble is due to a different cause. It is no secret that vibration has developed itself rather seriously in the vessel, and in Dr. Elgar's paper on "Fast Ocean Steamships" he expresses the opinion that the upper structure of vessels like the Campania must in the future be considerably strengthened in order to reduce the tendency to vibration. Of course in all such matters it is a difficult thing to determine where responsibility begins and where it ends, but when the position Dr. Elgar holds in the Fairfield company is considered, both as director and scientific advisor, and the fact that the designs of the Campania were submitted to him for approval, it is not too much to say that, whatever the responsibility, Mr. White is hardly entitled to bear it singly. Whatever may be the defects, without doubt, they will be tackled with energy and soon be put to rights."

## Jack-knife Bridge at Chicago.

The jack-knife bridge invented by Wm. Harmon and built at Canal street has been accepted by Chicago commissioners of public works. It requires 30 seconds to open and close the bridge. No center pier is necessary for this bridge and it is




especially valuable in narrow streams which are navigable. When open the bridge leaves a channel of 80 feet, and as seen in the illustration it folds up, permitting boats to lie on either side close to the piers.

## Signal Lights.

At the second meeting of the International Maratime Congress held in London during the week of July 17, Mr. J. Kennard presented a paper on signal lights. He proposed, that the general optical principles used in the construction of lighthouses should be applied to ships' lanterns; that there be a great increase in the amount of light given by ships' signal lanterns, and that the three lights should be of such power as to be visible at the same distance, the masthead light not being capable of being discerned before the red or green light; that all ships should carry lights of the same power; at present the glass of the red lamp absorbs 50 to 60 per cent. of the light, and that of the green lamp 70 to 80 per cent., so that the red and green lights are not seen until the masthead light has been visible for some time. Mr. Stephen H. Terry opened the discussion by advocating that the three lights should be placed in one plane across the vessel, the side lights being neither ahead nor astern of the masthead light. If this were made compulsory, it would be possible to know the exact course of an approaching vessel.

Captain Leclair, French naval attache, explained the standard he adopted to judge fog density on the banks of Newfoundland. He took the green light and measured the distance to which the projected cone of light extended, and according to this he classed the atmospheric condition as haze, fog or deep fog. He further described how the cone expanded with the thickness of the fog. In clear weather it is very sharp—almost a cylinder. In a haze the rays formed a very distinct cone which grew wider as the fog thickened. On his ship he had an empirical scale, founded on observations of the green light, by which the officer of the watch decided at what distance he could see the lamps of an approaching vessel in any weather.

---

The REVIEW predicted when she came out that the Pioneer on account of her engines and steaming power, being fitted with Howden's forced draft, would be speedy, but nothing was heard from her. Now it is claimed that from the Sault to Duluth she ran 397 miles in 24 hours and 5 minutes, giving her a speed of 16½ miles an hour, and making her the fastest freight boat on the lakes. She was bnilt by the Detroit Dry Dock Company for the Cleveland Cliffs Iron Company.

## Iron Mining.

VALUE OF LEADING STOCKS.

*Quoted by Chas. H. Potter & Co., No. 104 Superior St. Cleveland, O.*

| Stocks. | Par Value. | Bid. | Asked. |
|---|---|---|---|
| Cleveland-Cliffs Iron Company | $100 00 | $..... | $..... |
| Champion Iron Company | 25 00 | ..... | ..... |
| Chandler Iron Company | 25 00 | ..... | 30 50 |
| Jackson Iron Company | 25 00 | ..... | 75 00 |
| Lake Superior Iron Company | 25 00 | ..... | 24 00 |
| Minnesota Iron Company | 100 00 | ..... | 58 00 |
| Pittsburgh & Lake Angeline Iron Co. | 25 00 | ..... | 125 00 |
| Republic Iron Company | 25 00 | ..... | 8 00 |
| Ashland | 25 00 | ..... | ..... |
| Section Thirty-three | 25 00 | ..... | ..... |
| Brotherton | 25 00 | ..... | 2 00 |
| Iron Belt | 25 00 | ..... | 2 50 |
| Aurora | 25 00 | ..... | 7 00 |

On the 25th inst. shipments of ore from Two Harbors aggregated 451,142 tons, of which 234,299 tons was from the Chandler mine, 191,040 from the Minnesota, 15,887 from the Canton and 9,916 from the Cincinnati. On the 22d inst. the total from Ashland was 65,709 tons, divided among the different mines as follows: Ashland 26,465 tons, Aurora 92,992, Colby No. 2 11,320, Tilden 8,881, Germania 4,975, Iron Belt 5,833, Montreal, south vein 1,347, Montreal, north vein 21,652, Brotherton 14,643, Comet 5,035, Carey, west 26,333, East Norrie 41,003, Eureka 38,035, Newport 46,838, Norrie 116,459, Pabst 79,519, Sunday Lake 17,524, Davis 6,204, Jack Pot 1,651.

---

Steamer Sibley and consort took the first cargo of ore from the new Duluth, Missabe and Northern dock. It goes to Fairport. The dock has a seventy-foot channel sixteen feet deep on either side, and 100 ore pockets completed. There still remains 200 feet of dock to raise and 400 pockets to be lined and completed. Ten carloads of ore from the Mountain Iron mine were received—the first to reach the dock. The Missabe is likely to ship this year 600,000 tons of ore. Over 10,000,000 feet of timber were used in its construction. The dock and approach are said to have cost $400,000. It is 2,480 feet long, 50 feet wide and 52¾ feet above water. Four standard guage tracks are laid on top. It will have 500 ore pockets, each with a capacity of 180 tons.—Inland Ocean.

---

The total quantity of iron ore exported from Bilbao, Spain, from January, to July 15, says Industries and Iron, was 2,281,792 tons against 2,079,141 tons in six months of 1892. Prices on first quality range from $1.50 to $1.62. Out of 46 cargoes shipped one week 31 went to British and 15 to Continental ports.

---

Miners at the Aragon have agreed to the shipment of the 43,000 ton stock pile provided that the ore be shipped to M. A. Hanna & Co. of Cleveland. A payment of $1 a ton is to be made the day succeeding the shipment.

---

At the big Biwabik mine, on the Missabe range, ore loading is going on directly from the mines at the rate of a 24-ton car every four minutes. The ore is loaded with a steam shovel of two tons capacity, which is working directly ahead into the end of a cut. The ore is dry and fine grained and is handled with much ease.

---

The Franklin mine near Virginia, James Corrigan's property, made its first shipment over the Duluth and Iron Range last week. Ten cars were loaded the first day and the ore is very heavy, running about 25 tons to a car.

---

## A Great Cargo Boat.

The Hawgood & Avery steamer S. S. Curry does something surprising each trip. This time she could not get a full load of coal at Toledo without waiting but took up 3,300 tons which was unloaded at the Lehigh dock at Duluth in 13 hours. The dock manager says the cargo was handled with the least expense and that the Curry is more easily unloaded than any steamer that comes to that dock. Special attention was given in her construction to cargo handling facilities, and it is believed that she is not only the largest lake cargo steamer but that she is by reason of these facilities the most economical carrier.

## From the Head of Lake Michigan.

WESTERN OFFICE, MARINE REVIEW,
No. 701 Phoenix Building, CHICAGO, Ill., Aug. 3.

Few business bluffs receive as little attention as the strike of the Seamen's Union that was threatened last week here, and was to be extended to Milwaukee and all Lake Michigan ports. The idea of a man out of work striking amused the vessel owners, and they agreed to let the union strike if it wanted to. Many said that an action of this kind would be welcomed, for they were tired of running their boats at a loss and would like to see all the lumber fleet stopped for a short time, so that freights could have a chance to go up, and allow them to make a living.

Meanwhile the Lake Carriers' shipping office here is going right along and has put over 1,600 sailors on board boats this season. The shipping master has some thirty-seven cards and books that have been given up by union men, who have turned scabs, and he says if other sailors who shipped from his office were to be searched as many more cards and books would be found. It is stated that men have been hired here during the last week by captains of lumber schooners at just $1 a day, and that the men were anxious to go at that figure. It would seem that the dull times were destined to be a death blow to the union, for no organization can stand a constant drain of expenses when the men are all deserting.

Steamboat Inspectors Sinclair and Moore went at the passenger licences of some of the big excursion boats here with a meat axe, and the whaleback had her list cut from 4,000 to 3,465. Even at this figure passengers say that the boat was too full for comfort in a long run.

The Graham & Morton steamer Chicora did up the City of Toledo last Sunday, beating her into St. Joe by 14 minutes. This was somewhat of a surprise, for it was thought that the City of Chicago would have to be put on the morning run to beat the newcomer from Toledo, but the Chicora got up and got there in a way that surprised even her owners.

The Vessel Masters' and Owners' Association elected officers this week for the coming year. They are: Capt. Thomas Clark, president; Capt. Otto Oleson, vice-president; Capt. William Wilson, secretary; Capt. Halver Michelson, treasurer. A constitution and by-laws were drawn up and accepted. The association has over 100 boats enrolled and they get their crews when they need them from the Lake Carriers' shipping office. The members of the association realize that now is their time to right some of the disadvantages they have worked under so long, and are trying to get things in shape so that a Lake Michigan lumber schooner will be a paying investment again.

## No Depression at Buffalo.

Special Correspondence to the MARINE REVIEW.

BUFFALO, N. Y., Aug. 3.—The lake freight situation is not improved at this port, and though the depression is not felt here in any way as compared with other ports, the question will be the leading one till business revives. Buffalo is doing very well, having shipped more coal than last season to date, 1,187,125 tons against 1,171,580 tons to August last season, and received more grain than last year. The early receipts of flour, on account of the late opening of Lake Superior, have not yet caught up with last season, but July brought us 1,252,548 bbls. against 1,042,799 bbls. for July, 1892. The total flour receipts to date are 3,574,050 barrels for this season, to 3,988,367 barrels last season. At the July rate of receipts the falling off will disappear in two months. The total amount of grain, including flour received this season, is 76,784,871 bushels, against 72,569,918 bushels last season, which was nearly 30 per cent. above any preceding year. So Buffalo need not complain.

Capt. Eber Ward no doubt expressed an opinion that will be generally echoed by lake men when he said to me the other day that there would have been depression in the lake trade this season if the money market had held out. Over building has done its work. It is well that the shipyards here are setting up no more big vessels. It must be accepted as well also, with no malice towards anybody, that the whalebacks have not proved money makers when other vessels have to tie up. Had they been, the steel barge company would not have stopped buildiug until every other craft was driven out of business.

That was a beautiful break of the river reporters last week in reporting the Samoa and Vance as coming down together from Chicago, just as though the Vance wasn't lost in deep water off Point au Pelee on the up trip. Seeing both vessels when only one passed down must be set down as unconscious cerebration or something of the like. It is quite likely some of the daily papers published the passage of the old tow just as it was reported.

The lake papers should unite in giving the widest circulation to the request of Gen. Poe that all vessels slacken speed when passing the dredging or drilling operations of the contractors on the deep-water channel work. He sent the request to the Lake Carriers' Association this week, and Secretary Keep sent out circulars to all members repeating the request.

The Lake Carriers' Associatlon is receiving applications for membership from the owners of Chicago lumber barges. This fleet is all composed of small vessels, but it is acceptable for all that, even if there is a suspicion that the move is made to enlist the association against the Seamen's Union in the impending fight with the lumber fleet.

## Prosperous Canadian Marine.

Special Correspondence to the MARINE REVIEW.

KINGSTON, ONT., August 3.—The shipments of grain to Montreal this year is enormous on account of the unprecedentedly low prices. The forwarding companies have not vessels enough to carry all the grain offered and have completely neglected the coal and other trades. Not short of 9,000,000 bushels of grain have been transhipped here. The gang of shovellers have been worked at high pressure night and day. One shoveller in a barge grew weary, and sitting down, was asleep in a few seconds. He was carried twenty miles down the St. Lawrence before he was roused from the slumber that overtook him. The transportation companies complain that the facilities at Montreal elevators are not sufficient, that all the elevating warehouses should be filled and not a moment's delay be allowed. The elevating company replies that there is no reasonable cause for complaint and that none of the outgoing vessels have been detained beyond their hour for sailing through the fault of the elevating service.

The transportation companies get one-half a cent per bushel toll for handling so that the dividends this year promise to be very high. The Richelieu and Ontario Navigation Company also promises a dividend, the first in many years. The manager declares that the earnings of the company so far this season are much ahead of any previous year. The steamer Bohemian has been pulled off the rocks in Coteau rapids and is not seriously injured. Three weeks were wasted in trying other means to get her afloat but old wreckers said pulling was the only way and they were right.

This year finds several house-boats in use on the St. Lawrence river among the Thousand islands. Some of these floating palaces cost from $8,000 to $10,000. The owners have the houses towed about by tugs. They go down the Rideau canal and into out-of-the-way places but have all possible comforts in their "barges." Mr. E. W. Dewey will use his boat-house during the summer and will then send it to Chicago for exhibition at the World's Columbian Exposition. He calls it the Idler. It is 75 by 18 feet and draws 14 inches of water. The hull is of white oak. It has accommodation for 18 persons.

## Induced Draft, Hot Air and Serve Tubes.

During the recent meeting of naval architects the following discussion was brought out by a paper from Mr. Ellis, who gave the results of a series of trials made with a combination of induced draft, hot air and the Serve tube: "The results are in themselves unique, as we believe that it is the first time that so large a quantity of coal as 60 lb. per square foot of grate has ever been burnt in the marine type of boiler under forced or induced draught, and it is a point worthy of note that this has been done without detriment to the tubes. It plainly shows how nearly we are approaching to the locomotive boiler in results, where 80 to 90 lb. per square foot of grate are often consumed. The principle that Mr. Ellis wished to bring before the meeting was that by adopting the system advocated by him, as the results of his experiments, the number of necessary boilers could be reduced. This could, however, only be carried out where there was sufficient power to permit of its being done. Information was given to the meeting that a vessel was being fitted with boilers of 3,000 horse power, and that the two large steamers now being built for the American line would be similarly fitted. Further that the steamship Berlin had been running since March last, and that so far the results had borne out in actual work at sea those that had been obtained at the test. In our opinion we see no reason to doubt that forced draught in some form or otoer must come to the fore, and that before many years have elapsed. As the demand goes on one or another of the systems in existence will have to be adopted, and we think that it will be the one which will, in the long run, cost the least for repairs and at the same time be the least complicated in fitting."

## Notice to Mariners.

In the bulletin of recent changes in aids to navigation, issued by the light-house board, July 1, items No. 15 to No. 19 inclusive give information of changes in Superior pierhead light, Superior and St. Louis bays post lights, South Manitou fog signal, and Frankfort pierhead fog signal. To each bulletin is attached a slip on which communications concerning aids to navigation and light-house board publications, can be written. No postage is required for mailing this slip. Each master should obtain a bulletin, from the custom houses or from Washington. Single notices of all these changes have been sent out during the past three months.

A large number of entries have been made for the national regetta of the National Association of Oarsmen at Detroit, August 9th and 10th.

# MARINE REVIEW.

*DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.*

Chicago Office, Western Union Building, 706 Phoenix Building.
Published every Thursday at No. 516 Perry-Payne Building, Cleveland, O.

SUBSCRIPTION—$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, 75 cents. Advertising rates on application.


The books of the United States treasury department contain the names of 3,657 vessels, of1,183,582.55 gross tons register in the lake trade. The lakes have more steam vessels of 1,000 to 2,500 tons than the combined ownership of this class of vessels in all other sections of the country. The number of steam vessels of 1,000 to 2,500 tons on the lakes on June 30, 1892, was 321 and their aggregate gross tonnage 534,490.27; in all other parts of the country the number of this class of vessels was,on the same date, 217 and their gross tonnage 321,784.6. The classification of the entire lake fleet is as follows:

| Class. | Number. | Gross. Tonnage. |
|---|---|---|
| Steam vessels | 1,631 | 763,063.32 |
| Sailing vessels | 1,226 | 319,617.61 |
| Canal boats | 731 | 75,580.50 |
| Barges | 69 | 25,321.12 |
| Total | 3,657 | 1,183,582.55 |

Tonnage built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

| | Number. | Net Tonnage. |
|---|---|---|
| 1888 | 222 | 101,102.87 |
| 1889 | 225 | 107,080.30 |
| 1890 | 218 | 108,515.00 |
| 1891 | 204 | 111,856.45 |
| 1892 | 169 | 45,168.98 |
| Total | 1,038 | 473,723.60 |

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.

| | St. Mary's Falls Canal. | | | Suez Canal. | | |
|---|---|---|---|---|---|---|
| | 1892. | 1891. | 1890. | 1892. | 1891. | 1890. |
| No. vessel passages | 12,580 | 10,191 | 10,557 | 3,559 | 4,207 | 3,389 |
| Ton'ge, net regist'd | 10,647,203 | 8,400,685 | 8,454,435 | 7,712,028 | 8,698,777 | 6,890,014 |
| Days of navigation.. | 223 | 225 | 228 | 365 | 365 | 365 |

*Entered at Cleveland Post Office as Second-class Mail Matter.*

Now that reciprocity in wrecking has been agreed to by Canada and the United States the next thing which lake interests demand is the abolition of the treaty that prevents lake shipbuilders from building the smaller class of vessels for the new navy. If it had uot been for government work given coast yards in dull times it is possible that no such immense plants would be in existence. Lake ship yards have been busy building upan inland merchant marine that overshadows that of both coasts and has asked no favors of the government, the few light-house tenders that were built, having been constructed from 10 to 25 per cent. cheaper than they could be built on the coast. Lake ship yards can save the United States government money on war-ships as well as light-ships. It is claimed that Secretary of Navy Herbert will recommend appropriations in the coming Congress for a battle ship and several gun-boats or small cruisers, and that his idea of a small cruiser is something like the Detroit, having 2,000 tons displacement, or he even suggests that 1,500 tons displacement is sufficient. The dimensions of the Detroit are 257 feet long and 37 feet beam, while the Mackinaw and Keeweenaw constructed on the lakes were 289½ feet long and 41 feet beam and by cutting them in two they were taken to the coast and have proven themselves good sea-going steamers. But a cruiser of 1,500 tons displacement need not be over 200 feet long and such a vessel can be taken to the coast without being cut in two. The heavy armour plate and battery could be put on at the Brooklyn navy yard in order that the draught in the canals might not be too great to be overcome with pontoons. The new secretary estimates that $11,000,000 will be required to finish the naval work now in hand, and after that is provided for, lake congressmen should call a halt until the ancient treaty that prevents lake ship builders from receiving naval work is abolished. It is said that a wise and generous policy will be characteristic of the navy department for the next four yearr. Take down the bars and let this wise and generous policy come grazing around lake ship yards.

---

THE president of the United States issued July 17, the proclamation which puts in force the reciprocity in wrecking privilege between this country and Canada, The act was approved May 24, 1890, and reads as follows: "That Canadian vessels and wrecking appurtenances may render aid and assistance to Canadian or other vessels and property, wrecked, disabled or in distress in the waters of the United States contiguous to the Dominion of Canada." It was provided that the act should not take effect until a similar privilege had been extended by the Canadian government. It was construed that the provision should apply to the Welland canal and other connecting waterways, but this was amended March 3, 1893, by striking out the words Welland canal. In the proclamation the text of the Canadian act is given, which reads as follows: "United States vessels and wrecking appliances may salve any property wrecked, and may render aid and assistance to any vessels wrecked, disabled or in distress in the waters of Canada contiguous to the United States. Aid and assistance include all necessary towing incident thereto. Nothing in the customs or coasting laws of Canada shall restrict the salving operations of such vessels and wrecking appliances." Both acts are revokable by proclamation whenever either country withdraws the privilege. From the date of the proclamation wrecking privileges are open to any boat in all waters of the lakes.

---

THE supervising inspector at their next meeting to be held in Washington this winter will very probably take some action on the fog signal which at present is sometimes confounded with the porting signal, causing in several instances serious collisious. A master stated recently that there were defects in the system of engine room whistle signals. He said that there were a number of different whistles used for general alarm, and added that so far as possible the long whistle shonld have no significance that would make it confounding if it was blown because of the whistle cord catching when a short whistle was intended. There should be a uniform signal for tugs, and if of sufficient importance signals might be agreed upon for obtaining assistance in cases of distress from life saving stations, although it seems that one difficulty at present is the large number of whistle signals that are not necessary at present. One code of whistles signaling bridges to open should be arranged so that it would apply to all navigable rivers and branches. If there is anything that you think should be changed in the system of whistle signals, or you have anything new to suggest write to the REVIEW, and if practicable the information will be put in the hands of those who can remedy the matter if a remedy is shown to be necessary.

---

THE "Tips from the man on the dock" space is filled with especially spicy matter this week. Other marine papers are beginning to appreciate the good things in this column. One especially takes three or four sticks full from it without stating where it came from. If you do not wish to credit the REVIEW with it be honorable enough to give "the man on the dock" credit for his "tips."

---

The Progress Steamship Company, says the Marine Journal, has been organized under the laws of New Jersey by James Jerome of New York and Arthur Hill, Eben Briggs and Geo. M. Stevens of Saginaw, Mich. The capital is $100,000 and it is proposed to conduct a passenger steamer business in New York harbor, and also on the lakes. Most of these parties are interested in the Saginaw Steamship Company who had the Mackinaw and Keeweenaw built by F. W. Wheeler & Co., for coast service. The formation of this new company may be the opportunity for some lake ship yard getting a contract.

## Tips from the Man on the Dock.

I saw an old head the other day who was lamenting the decadence of sailor men in these days, and it gave rise to some reminiscences of the storms they had and the way they handled vessels. "Yes," said a gentleman present, "they had trying times in those days, and gallant sailors." "I remember," said he, "when Matt Whittemore kept a restaurant and bar at the foot of Bath street, right where the Pittsburgh freight house stands. It was a resort for captains who congregated there when in port, and many a fine yarn was spun there.

"Old vessel men will remember Capt. Bill Simonds, who sailed the brig Iroquois. He was a splendid sailor, none better, but his one peculiarity was that he never let himself be outdone in a story. He would generally manage to give his experience last, and no matter how wonderful the experience of the others, his was more remarkable, and the way he would tell and stick to his story was enough to convince the most skeptical.

"After a heavy blow on Lake Erie, different captains were telling their experience coming up the lake. Each one told some thrilling experienee of how his vessel rolled and pitched. One had pitched until she had dove her jib-boom and bowsprit right under the anchor chain, and came up with the chain on the opposite bow. This beat all the others, and it was time for Simonds to speak up. He said that was great pitching, they had all had a hard experience, 'but gentlemen,' said Bill, 'you never saw a vessel roll. I was coming up along the south shore, and such rolling I never saw and hope to never see again, but the old Iroquois was equal to it. Why gentlemen, she would roll to windward and then take a lee roll and go right down on her beam ends as if she would roll right over. But she would come up again, and then take another fearful lee roll. You can judge how she rolled. You all know that bluff near Ashtabula with the meadow running back from the edge of it; we were right off there, I was holding on at the rail, she was rolling heavy and my feet slipped. Away I went, I thought I would go right down and out over the rail, but I caught at the center board well, and as she rolled—gentlemen, every man here knows I never tell anything but facts—as she rolled, I looked right clean through the centre board box and there I saw the sheep feeding on that meadow. That was about the first time in my life I ever remember being scared—when I saw she was rolling her keel clean out of the water like that—but the old Iroquis was equal to it, and she pulled through, and here we are all ataunt'o.'"

***

Speaking again of having some one to lean upon in time of danger brings to mind an instance. A now well known vessel master was on the witness stand for the first time in his life. His testimony related to a certain equinoctial gale, in which he had been out some three years before giving his testimony. To the surprise of every one, and the discomfort of the side calling him as a wituess, he gave all the particulars of the storm, told the hour and the minute when the first sea boarded the vessel, and with each detail gave the exact time, all without referring to any memorandum. On the cross-examination he could not remember the particulars of any gale of wind since, and when put to it he could not remember anything at all about the equinoctial gales in the fall preceding his giving testimony.

It looked decidedly as if he had remembered altogether too much about that particular gale, when the lawyer, casting a triumphant look around, asked the witness if he would not be kind enough to explain how he could go back three years and tell all about that gale, and yet could not even tell whether there was an equinoctial gale three months ago. "Yes," said the captain, "I will explain, and if you don't say my explanation is satisfactory I will buy you a new hat." Then he explained that although he had been mate for years this was the first time he had ever been out in a storm when he had more to do than carry out orders and let the old man do the thinking and planning. "I made up my mind that if ever I got that vessel into port I would resign the command and be content to serve the balance of my days as mate, and let some one else carry the responsibility." "Why didn't you do that?" asked the lawyer. "Well," replied the captain, "we carried away a little rigging, but when we got to Chicago I found that lots of vessels had gone ashore or been dismasted, and I had come out as well as any one and better than a good many,—and besides, the sun was shining then, and that made a big difference." "Since," continued the captain, "I never bothered so much about going through a gale on my own responsibility, and it soon got to be an old story, but I shall remember to my dying hour every little detail of that first one." It is hardly necessary to say that the new hat was not demanded.

***

An interesting talk was that of a lot of old-timers who got together on the occasion of the inaugural trip of the C, & B. line.

One by one they recalled the old steamers of what seemed to them the palmy days of lake steamboating.

They were high pressure boats, and these friends solemnly declared that it was a common experience to hear the exhaust of one of them and to bet on her identity from the sound long before the boat came in sight.

One of them, a prominent citizen, was made to tell of his shooting Joe Thompson full of dried peas.

The hero of the story slept up in an elevator in Buffalo with several kindred spirits. They were in the habit of coming in at all hours. The place was large, gloomy, and suggestive of spooks, and it was easy to get to talking about ghosts, until all would duck their heads under the bed clothes and go to sleep.

A ghost all in ghostly white began to haunt the place to the terror of all hands, until one night the hero, returning from a ball in the small hours of the morning, fired with the courage that used to be passed around at balls in those days, said. "I'll fix Mr. Ghost." He got an old fashioned blunderbuss, put in an enormous charge of powder, filled the rest of the barrel full of hard dried peas, and went to bed.

Soon the ghost made his appearance. Our hero peeping cautiously out from beneath the bed clothes, took such aim as he could, and pulled hard on the trigger. There followed a report like that from a Krupp siege gun, and two soul piercing yells, one from the man who fired the gun and received the kick, the other from the man who was impersonating the ghost, and received the charge. But when they laid Joe on a board in a neighboring saloon and spent the rest of the night picking dried peas out of him, he made a solemn vow, never since broken, that he would let ghosts do their own night walking for the future.

***

There is a bad habit on some vessels of not replying to the report of a lookout. How can a lookout be expected to do his duty faithfully when he reports a light and gets no response from the officer of the deck.

---

## The Story of a Dictionary.

Our ship was rated "A 1" and manned by twenty "A. Bs." who saw things "abox" and soon put the anchor "a-cock-bill." The mate was cussing because the hawsers were laid up "against the sun," but he stopped to go for the wheelsman when she came "all in the wind." There were some rocks "awash" to the "leeward," but just as I was going to tell the mate, he said "avast there." The tide was coming in and it looked for a minute as if we would be "back-strapped" before we got out to sea, but we "bag-piped" the mizzen and she moved off like a yacht flying a "baby jib topsail." We passed a "bark" and a "barkentine" but the captains of both looked like "barrators" and we didn't hail them, "Get the 'best bower' ready" came the order, and just then we saw three or four of "Mother Carey's chickens." One of the men stumbled, but saved himself from going overboard by catching onto the "bob-stays." At mess a "bowline lizzard" was thrown at the second cook because the manavelins were cut short. The man who threw it was put in the "brig." He fell over a "bunt-line" tackle and got ten lashes extra for his awkwardness, but what could you expect of a "butter box." We were soon called on deck in a hurry. The rocks we had noticed were discovered by the look out and the captain decided that a "club haul" was the only thing that would save the ship. As soon as we were clear every yard was decked out with "corposants" and we all began to show favors to a holy Joe who had a Bible in his dunnage. For the continuation of this story, buy a copy of Patterson's Illustrated Nautical Dictionary, which defines all these terms and 5,000 more.

---

U. S. ENGINEER OFFICE 34 West Congress st., Detroit, Mich., July 29, 1893. Sealed proposals for (A) centrifugal pumps; (B) the driving machinery; and (C) the Babcock & Wilcox boilers for pumping plant for St. Mary's Falls Canal will be received at this office until 2 p. m. September 27, 1893, and then publicly opened. Specifications, blank forms, and all available information will be furnished on application to this office, O. M. POE, Col. Corps of Engineers, &c. 8-24

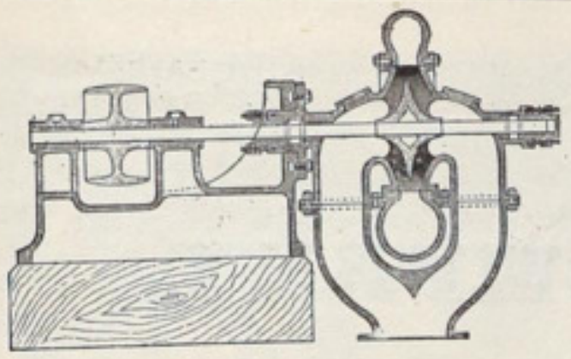
## Early Lake Navigators.

During the years 1872 and 1878 and some years later, Capt. J. W. Hall, marine reporter at Detroit, Mich., published volumes containing general information on lake commerce, among which is a chapter on early lake navigators. There are only a few copies of the books in existance, and as many captains still in lake service sailed with those mentioned or at least knew them, the chapter is worth a reprint in the REVIEW. In the issue of 1878 the dates of the opening of navigation to Lake Superior are given from 1855 to 1877. The name of the boat passing first is given with that of the captain. In 1859, navigation was opened by the steamer Lady Elgin, Capt. J. Nelson, passing through May 3. The most interesting, however, is this: "1860, May 11, Prop. Fountain City, first boat, Capt. E. M. Peck." Capt. Peck built the Fountain City in 1857 in Cleveland and from present indications will outlast her. In 1863, Capt. Thos. Wilson took the Mineral Rock up April 28. In 1861, '67, '68, '71 and '72 Capt. Albert Stewart, with the Michigan the first year and the Keweenaw the following year, was the first to go through the Sault. Capt. M. H. Murch with the Northern Light opened navigation, May 7, 1866. This would give Capt. Murch twenty-seven years as master on the lakes, if that was the first year he sailed in that capacity. In 1869, May 7, the propeller St. Paul, Capt. Geo. McKay, was the first boat.

"The steamboat men of the earlier times are at present (1872) limited to a comparative few, and of these Captains William T. Pease, a resident of Buffalo; L. A. Cotton, of Detroit; David Wilkeson, of Perrysburg, O., and Harry Whittaker, of Buffalo, are the oldest on the record. The command of the first steamer, the Walk-in-the-Water, devolved on Capt. Job Fish, an imported man from the east, whose knowledge of lake navigation did not extend very far, and who resigned his post on encountering the first gale, which occurred on his third or fourth trip, and delivered over the safe management of the vessel to John Davis, his mate, before reaching port. Jedediah Rogers subsequently commanded the Walk-in-the-Water to the close of her career. The Superior being the second steamer on the lakes, was placed in command of Capt. Roger Sherman, who, although imported, as was the case of Capt. Fish, proved himself equal to the position, and continued as master of the same boat two or more seasons, when he returned from whence he came. Capt. W. T. Pease commanded respectively the Niagara, first Pioneer, Superior, Niagara, the second, and others at a later period, including the Boston. He was also master at one time of the schooner Michigan, which was sent over Niagara falls. Capt. L. H. Cotton commanded the first steamer that ever towed a vessel up the Fort Erie rapids, the steamer being the Monroe, and the vessel the ship Milwaukee. He was master of the steamers Ohio first, Pennsylvania, Daniel Webster, Oregon, Baltic, Anthony Wayne, and the mammoth steamer Western World. In 1835 he fitted out the brig Queen Charlotte, which, during the war of 1812, was captured from the British, and for many years lay sunk at Erie, Pa. Capt. David Wilkeson commanded the schooners Eagle and Gurriere, his first steamer being the Commodore Perry, until the close of her career, when himself and others built the Superior second, which he commanded for several years. Capt. C. L. Gager was with Capt. Levi Allen, James Harrington, Loring Pierce, and John Kimberly as seamen on the Walk-in the-Water. He bought and sailed the steamer Red Jacket, then the Gen. Porter, which he converted into a propeller, and afterwards the Albany. Capt. Walter Norton was among the early pioneers, sailing the schooner Michigan and steamers Henry Clay, Gen. Porter and Michigan. Capt. John Mills sailed vessels for several years, among others the Erie. He afterwards sailed the steamboat Enterprise somewhere in the years 1834-5. Capt John F. Wright, commanded the Wm. Penn, and subsequently the Chicago. Capt. Harry Whittaker was not only prominent as a steamboat navigator, but also a promoter of steamboats, and through the intrigues of others had his fortune wrecked on more than one occasion. At an early day he sailed the schooner Marie Antoinette, then the steamers North America, Monroe, United States and A. D. Patchin. What was never previously nor since achieved, he navigated with the steamer United States through the winter of 1845, between Buffalo and Detroit. Capt. Morris Tyler was also a vessel man at the first, and in 1831-2 sailed the schooner Cincinnati. He also commanded the steamers Ohio first, Daniel Webster and James Allen. He last sailed the brig Columbia, which he owned and built. Capt. John Fleeharty commanded the steamers W. Peacock and Pennsylvania, and on his retirement went into the forwarding business at Huron, Ohio, and subsequently at Buffalo. Capt. Chesley Blake died at Milwaukee, with cholera, in 1849. He commanded the schooner Hannah, Napoleon and steamers Niagara, Michigan and Illinois. Capt. August Walker was probably one of the most prominent navigators in aiding and furthering steamboat interests that ever sailed the lakes. He built the steamers Sheldon Thompson, Washington first, Columbus and Great Western, and first commanded the steamer United States. The Western was the first steamer on the lakes provided with upper cabins. Capt. Levi Allen, one of the most popular lake men throughout his sailing career, commanded respectively the steamers United States, Superior, Pennsylvania, Buffalo and Niagara second. Capt. Archibald Allen commanded during his time the steamers Michigan and Nile. Capt. Simeon Fox will be remembered by many acquainted with early lake events. He served on board sail craft the greater part of his time, and at one period sailed the schooner Amaranth. He also commanded the steamer Charles Townsend and Chautauqua, the latter when plying between Buffalo and Barcelona.

"Capt. Thomas Wilkins was a man unsurpassed in popularity by any who ever came before or after him. In connection with his duties he always maintained the strictest sobriety. He was the commander of the steamers Wm. Peacock, Thos. Jefferson and Missouri, and after retiring from the lakes, served as collector of customs at Erie, Pa. Capt. Sam. Chase commanded in his day the steamers Ohio first, also the Gov. Marcy and the Monroe. Capt. Charles Burnett, familiarly known as 'Buck' Burnett, commanded the steamers Ohio and the New England. After his retirement from the lakes he was appointed harbor master at Buffalo. He died like most all sailors, very poor. Capt. James Lundy commenced his career on board sail vessels, the schooners Detroit, Maria and he commanded steamers Pennsylvania, Cleveland first, Uncle Sam, Constellation, Rochester, Baltic and City of Cleveland. He was a man of strict habits and always popular. Bob Wagstaff, as he was familiarly called, will not soon be forgotten by many. He commanded the first and finest ship ever on the lakes, the Julia Palmer, in 1836. Capt. Charles Stannard commanded the brig Ramsey Crooks on Lake Superior, also the steamboats Niagara, Bunker Hill and Saratoga, and died at "the bells," on board the Western World, on leaving the dock at Detroit in 1856. Capt. A. E. Hart commanded steamers United States, Cleveland first, propellers Oregon and Edith. His brother Capt. Robert Hart sailed at an early day the sloop Wm. Tell and the steamer Robert Fulton and propeller Paugassett. The steamer Chippewa, built at Buffalo, without frames, with the shape or model of a muskmelon, was sailed by Capt. Benjamin Armstrong, who also commanded the schooners Sterling and Brittania, besides other craft. Capt. G. Appleby sailed the schooner New Connecticut, which capsized in Lake Erie, and three days afterward a woman was rescued from the cabin alive, which was conceded one of the most remarkable events of the times. Capt. Thomas J. Titus commanded the schooners Aurora, United States and steamers Ohio first, Sandusky, Erie, Buffalo, Queen City and Julia Palmer. His last command was that of the propeller Monticello, and while on Lake Michigan was drowned from the small boat while attempting to land. Capt. H. VanAllen combined the qualities of the sailor and gentleman. His sailing career began on the Canada side, and on the American side he was on board the Mayflower and Empire State, two of the finest steamers that ever floated. The steamer Thames was commanded by Capt. G. R. Williams, plying between Buffalo and Port Stanley. Capt. F. S. Atwood was among the first navigators on the lakes. Besides sail vessels, he commanded at different periods the steamers Macomb, Monroe, Gen. Harrison, Troy, Arrow, T. Whitney and Parsons. Capt. Aaron Root sailed the schooner Amaranth, steamers Constellation in 1836, Bunker Hill in 1837, and subsequently the propeller Henry Clay. Capt. Joel H. McQueen commanded the steamer Constellation in 1837 and afterwards the Sam. Ward. He also at one time commanded the schooner White Pigeon. Capt. John Shook sailed the schooner Cincinnati and steamers United States and Columbus. His brother, Capt. Jim Shook, sailed the fine clipper brig Illinois in 1865, of the Eagle line, when it was fashionable to have the pea jacket ornamented with the spread eagle. Capt. Cliff Belden died at Cleveland in August, 1858. At one time he commanded the steamboat Star. Capt. A. H. Squier sailed the schooner Languire, steamers DeWitt Clinton, Garden City and others. Capt. Amos Pratt, long a prominent lake navigator, will be recollected as master of the steamer Anthony Wayne, or Mad Anthony, as she was at first called. He also commanded one of the first propellers on the lakes, the Samson in 1843. Capt. Wm. Dickson commenced life as a ferryman between Black Rock and Fort Erie."

[*To be Continued.*]



## Centrifugal Pumping Machinery

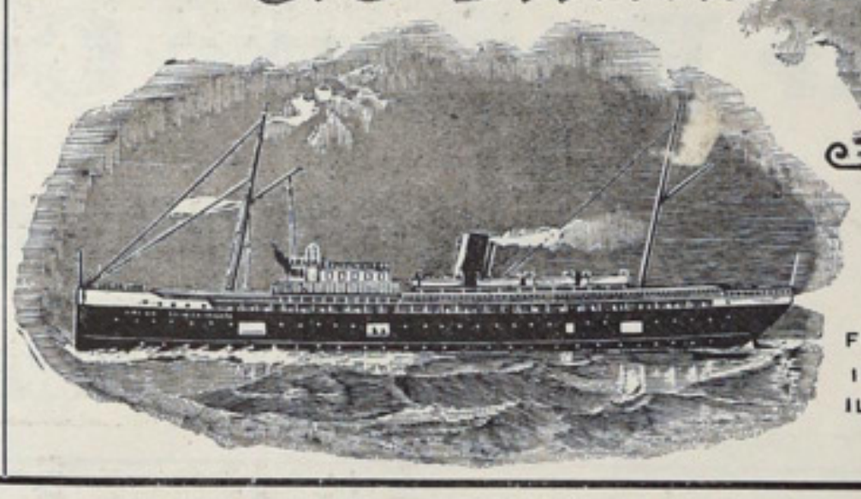
MANUFACTURED BY **LAWRENCE MACHINE CO.**

Adapted to requirements of contractors, wreckers, pumping out docks, cofferdams, and water bottoms of steel vessels.
Address for catalogue and prices,

**R. H. ALDRICH, Engineer,**
43 Builders' Exchange, BUFFALO, N. Y.

---

# E. S. Richardson Fueling Co.



## COAL

DOCKS
FOOT NO. MARKET ST
18TH ST. BRIDGE,
ILLINOIS CENTRAL SLIP "C"

OFFICE. 54 LA SALLE ST.
CHICAGO ILL.

---

# MARINE VALVE OIL

**For Cylinder Lubrication is unsurpassed, and is used in 90 per cent. of the large steamers on the great chain of lakes.**

STANDARD OIL COMPANY, MARINE VALVE OIL, CLEVELAND, O.

Marine Valve, Renown Engine, Eldorado Engine, Crank Case, Artic Cup Greases, Victor Signal, Dark Lubricating, and Lard Oils. Mineral Seal, Head Light,

— CARRIED IN STOCK AT THE —

## Standard Oil Company's Marine Depot,

**123 River Street, CLEVELAND, O.**

TELEPHONE 77. MAIN OFFICE TELEPHONE 682.

ALSO FOR SALE BY

*STANDARD OIL COMPANY,*

No. 5 Wabash Ave., Chicago, Ill.
Racine, Wis.
Broadway & Mason, Milwaukee, Wis.
Sheboygan, Wis.
Manitowoc, Wis.
Green Bay, Wis.
Marinette, Wis.
Oshkosh, Wis,
Duluth, Minn,
West Superior, Wis.
Hancock, Mich.
Marquette, Mich.
Sault Ste. Marie, Mich.
Michigan Central Railway & 10th St., West Bay City, Mich.
Eighth & Sears Sts., Saginaw, Mich.
46 Jefferson, Detroit, Mich.
Summit & Monroe Sts, Toledo, O.

STANDARD OIL COMPANY. RENOWN ENGINE OIL CLEVELAND, OHIO. TRADE MARK

ATLANTIC REFINING COMPANY, French & 16th Sts., Erie, Pa.
D. ROBESON, Port Huron, Mich.
W. S. MCKINNON, Ashtabula Harbor, O.
HULL & RAND, Huron, O.
STANDARD OIL COMPANY, Star Oil Works, Buffalo. N.Y.
BABY & DALE, St. Clair, Mich.
N. C. ALTEN, Lorain, O.
A. F. HARRINGTON, Conneaut Harbor, O.
A. H. MCGONAGIL, South Chicago, Ill.
MARINE SUPPLY CO., Fairport, O.
F. KRANZ, Sandusky. O.
THE M. I. WILCOX CORDAGE & SUPPLY CO., Toledo, O.

---

**F. W. WHEELER,** President.
**E. T. CARRINGTON,** Vice-President.
**F. L. GILBERT,** Secretary.

# F. W. WHEELER & CO.,

## WEST BAY CITY, MICH.

Builders of all kinds of METAL AND WOODEN SHIPS.

---

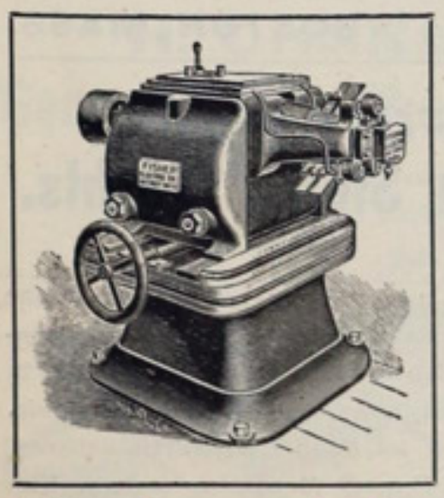
# "PL" DIXON'S "PL" GRAPHITE.

**Dixon's Perfect Lubricating Graphite is indispensible to every engineer and machinst. It can be used dry or mixed with water, oil or grease. We send free of charge a sample and pamphlet with interesting and instructive information.**

JOS. DIXON CRUCIBLE CO., JERSEY CITY, N. J.

---

**THE following Passenger Steamers employed at the WORLD'S FAIR are equipped with our Lighting Plants: We invite our friends and prospective customers to make an inspection of these Plants:**



CHRISTOPHER COLUMBUS—Two 400 light direct-connected twin compound engines and dynamos with 800 lamps and search light.

ARTHUR ORR—Two direct-connected engines and automatic dynamos, 350 lamps.

CITY OF TOLEDO—Automatic belted engines and dynamo, 210 lights.

**Fisher Electric Co.** 183, 185 & 187 Larned Street, West, **Detroit, Mich.**

WILLIAM L. BROWN, PRESIDENT. W. F. COBB, VICE-PRESIDENT. W. I. BABCOCK, MANAGER. O. R. SINCLAIR, SECRETARY.

# CHICAGO SHIP BUILDING COMPANY,

## STEEL STEAM-SHIP BUILDERS,

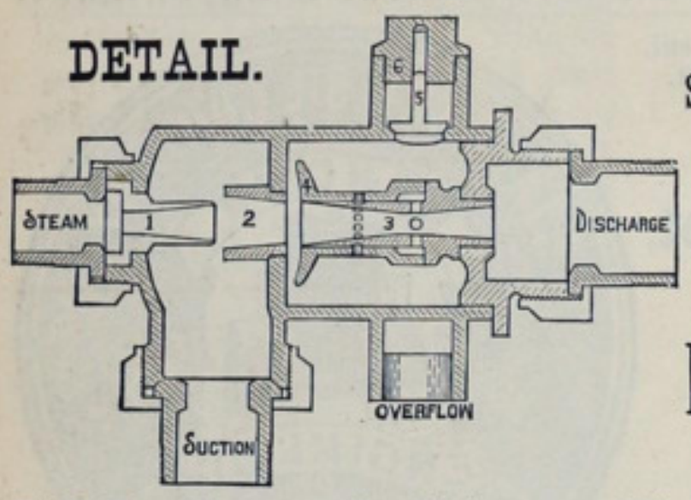
TELEPHONE No. 40.
South Chicago Exchange.)

101st St. and Calumet River, COLEHOUR, ILL.

---

# The Globe Automatic Injector.

DETAIL.




See the SIMPLICITY OF IT!

SUPERIOR FOR MARINE BOILERS.

Write for Particulars.

Eagle Lubricator Co.

MANUFACTURERS,

108 Canal St., - Cleveland, O.

---

## A NEAT TRICK.

OWNER—Captain, do you want to see a neat trick explained?
CAPTAIN—Yes sir, what is it?
OWNER—Here is a circular explaining CRAWLEY & JOHNSTON'S "Cincinnati" Automatic Steam Steerer.
CAPTAIN—(After a careful study.) That's the best and simplest I ever saw. "Its a corker." Put one of them on my boat and I'll show you some quick work and save the price of it in a few trips.
OWNER—I'll do it, and adv'se my friends to invest'gate it.—Write for prices, etc.

CRAWLEY & JOHNSTON, 119-121-125 East Pearl St., CINCINNATI, O.

---

GEORGE B. CARPENTER. ESTABLISHED 1840. BENJAMIN CARPENTER.

# GEO. B. CARPENTER & CO.

## *Ship Chandlers and Sail Makers.*

CORDAGE, TWINES, COTTON DUCK,
MILL, RAILROAD and VESSEL SUPPLIES.

202, 204, 206, 208 So. WATER STREET,
CHICAGO, ILL.

---

# H. G. TROUT
# KING IRON WORKS,

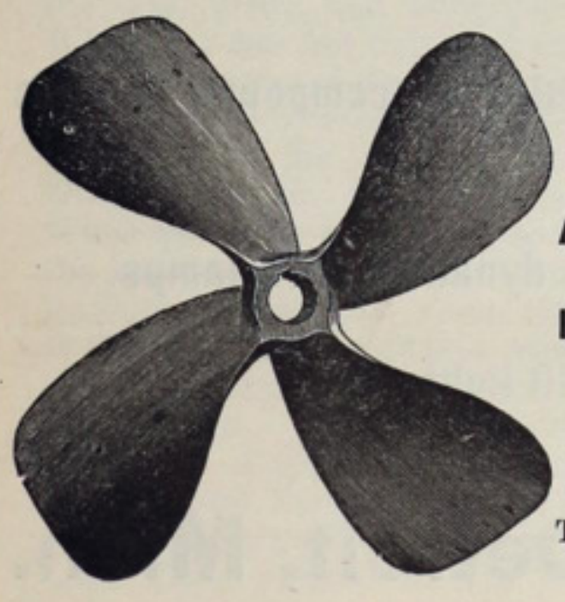
BUFFALO, N. Y.,

MANUFACTURERS OF

TRIPLE EXPANSION,
THREE CYLINDER,
FORE AND AFT
And STEEPLE COMPOUND
MARINE ENGINES,

High and Low Pressure Engines,
Sectional, Propeller,
Tug and Yacht Wheels.

Cowles Aluminum and Manganese Bronze Propeller Wheels.



These Wheels are noted for their extra speed, towing power and proportionate saving of coal.

PRICES QUOTED ON APPLICATION.

---

# THE JENKS SHIP BUILDING CO.

Will have FOR SALE OR CHARTER by the begining of navigation, 1893,

## THREE (3) STEAMERS

Especially Designed for the Lumber Trade.

If interested, address them at PORT HURON, MICH.

---

# C. H. McCUTCHEON,

(Successor to SAMUEL McCUTCHEON.)

## Copper, Tin and Sheet Iron Manufactory,

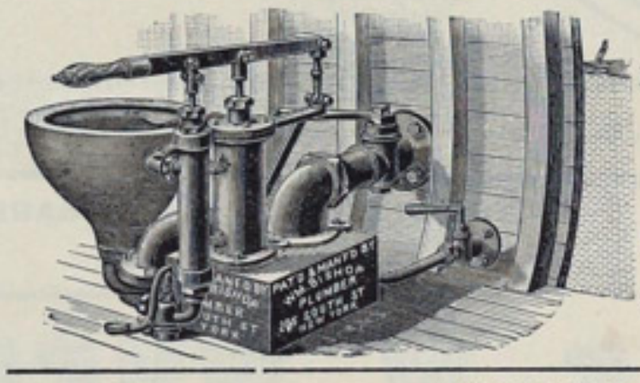
Steamboat and Engineers' Supplies.

All kinds of Brass Cocks, Globe Valves and Couplings, &c. Iron Pipe and Fittings, and Mill Supplies. Rubber Belting, Hose and Packings, Springs, Valves, &c., Leather Belting and Usudurian Packing.

Telephone No. 68. No. 18 Ohio Street BUFFALO, N. Y.

---

# COMBINATION PUMP WATER CLOSET



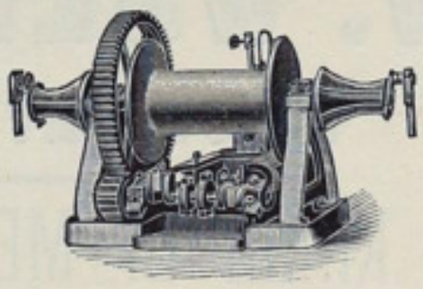
For Yachts, Pilot Boats, Naval Ships, Etc.

For above or below water line. No tank needed, and when below water line you can flush bowl without having to use pump.

WILLIAM BISHOP,
Plumber, Coppersmith & Steam Fitter,
Telephone 4811 Cortlandt,
205 South Street, NEW YORK.

Yacht Fittings a Specialty.

---



# JACKSON & CHURCH,

Builders of DUPLEX HOISTING and DECK ENGINES.

Plain Finished and Automatic **ENGINES**, From Heavy Patterns at Moderate Prices.

Vertical, Horizontal, Marine & Locomotive **BOILERS** Strictly First-Class and Highest Test.

Send for Circulars and Prices. SAGINAW, MICH.

---

# SHIP LAMPS.

OIL AND ELECTRIC FIXTURERS

FOR

## Steamships, Yachts, &c.

GREAT VARIETY OF DESIGNS.

Prices and Cuts on Application.

PAGE BROS. & CO.,

(FORMERLY WILLIAMS, PAGE & CO.)

227 to 233 Cambridge St., BOSTON, MASS.

---

## Haycox Sight Connection

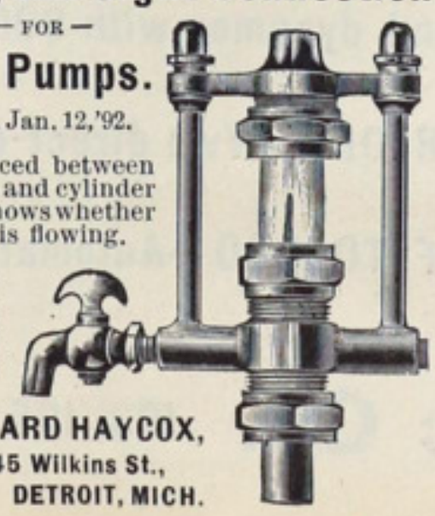
— FOR —

## Oil Pumps.

Pat. Jan. 12, '92.

Is placed between pump and cylinder and shows whether oil is flowing.

Write for Prices and Circular.

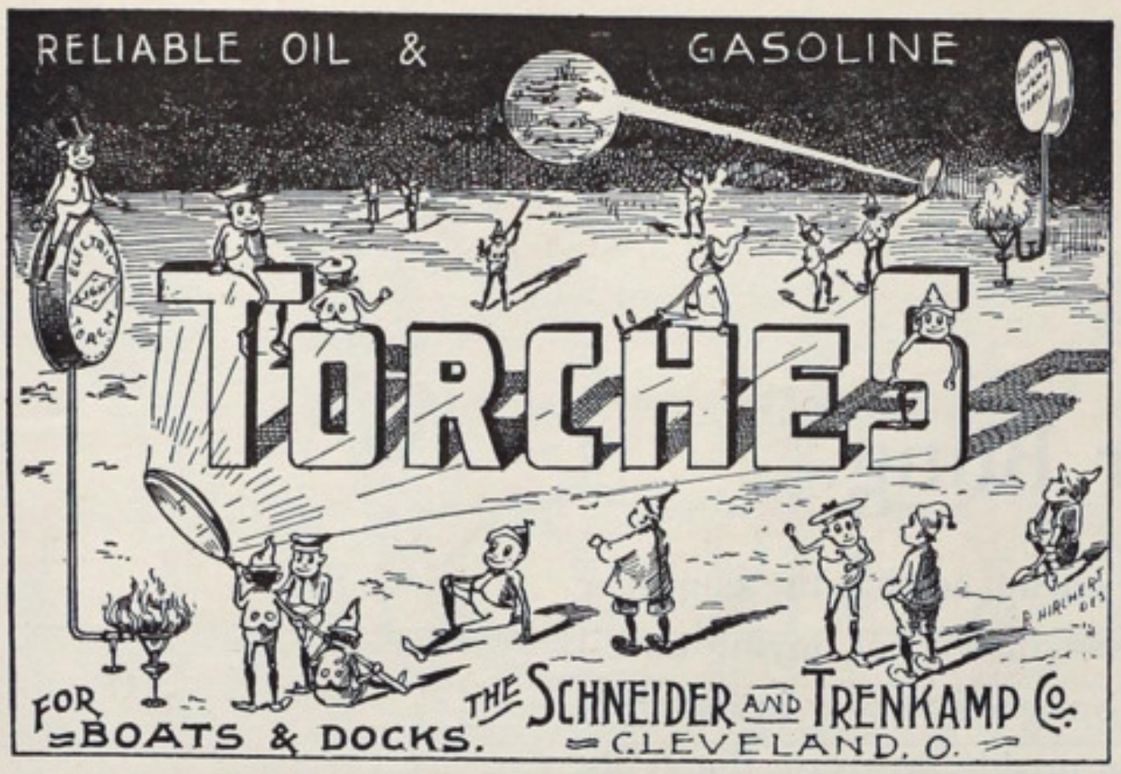


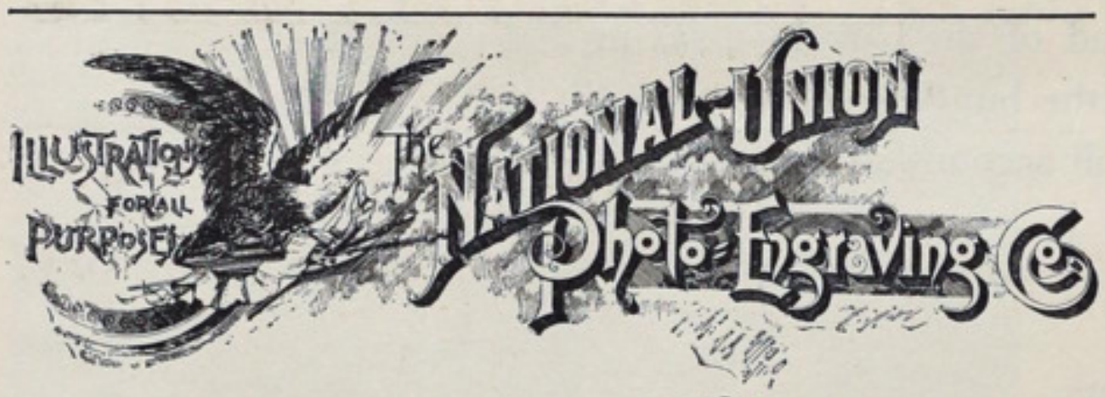
EDWARD HAYCOX,
145 Wilkins St.,
DETROIT, MICH.

---

# FOR SALE.
# Ten Steam Yachts.

Now in use carrying passengers at the World's Fair, Chicago. Will sell and contract to deliver them afloat in any waters in the U. S., after the close of the fair, November 1st, two for immediate delivery. Licensed to carry 75 passengers each. The chance of a lifetime for anybody wanting a steam yacht. CHAS. P. WILLARD & Co., Clybourn and Southport Aves., Chicago, Ill.




Photographs and Drawings reproduced for all kinds of Printing.

Cleveland, O.

1880. 1893.

# CHAS. H. POTTER & CO.,

# Investment Bankers,

## Cleveland, O.

Dealers in

**Lake Superior Iron Mining Stocks,**

on about 10 per cent. annual dividend basis, Republic Iron Co., Lake Superior Iron Co., Champion Iron Co., Minnesota Iron Co., Jackson Iron Co., Cleveland-Cliffs Iron Co., Chandler Iron Co., Chicago and Minnesota Ore Co.

## CONNELLY BROS. & CO.

OHIO, Cor. Michigan St., BUFFALO, N. Y.

## SHIP CHANDLERY, PAINTS, OILS,

AND VESSEL SUPPLIES.

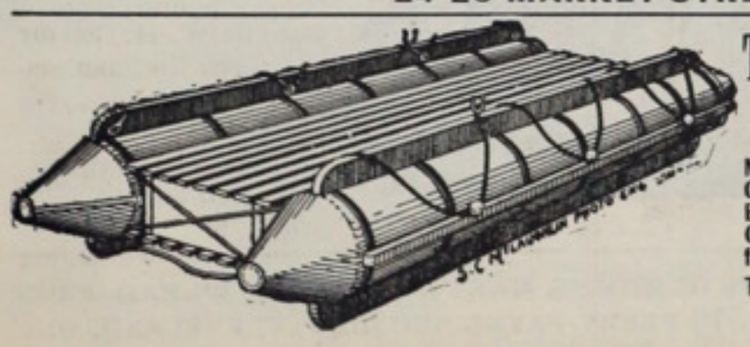
U. S. ENGINEER OFFICE, 34 West Congress street, Detroit, Mich., July 21, 1893. Sealed proposals for manufacturing and erecting in place the gates for the 800 feet lock, St. Mary's Falls canal, will be received at this office until 2 p m. September 19, 1893, and then publicly opened. Specification, blank forms, and all available information will be furnished on application to this office. O. M. POE, Col , Corps of Engineers, etc. 8-17

## H. CHANNON COMPANY,

## General Ship Chandlers and Sail Makers,

Dealers in Manilla Rope, Wire Rope,
Tackle Blocks, Cotton Duck, Anchors, Chains, Etc.

24-26 MARKET STREET, CHICAGO, ILL.



## Thos. Drein & Son,

BUILDERS OF

Metallic Life Boats and Rafts, Government and Pleasure Boats. Block and Granulated Cork Life Preservers. Outfit for Lake Steamers a Specialty.

TATNALL & RAILROAD STS.
Wilmington, Del.

## AMERICAN CHAIN CABLE WORKS.

ESTABLISHED 1865.

Cable, Dredge, Quarry, Shipping, Crane and Rafting

## CHAINS.

Our DREDGE and CRANE CHAINS are made of IRON ROLLED SPECIALLY for that purpose. Send for Price List.

J. B. CARR & CO., Manufacturers, TROY, NEW YORK.

## YACHTING!

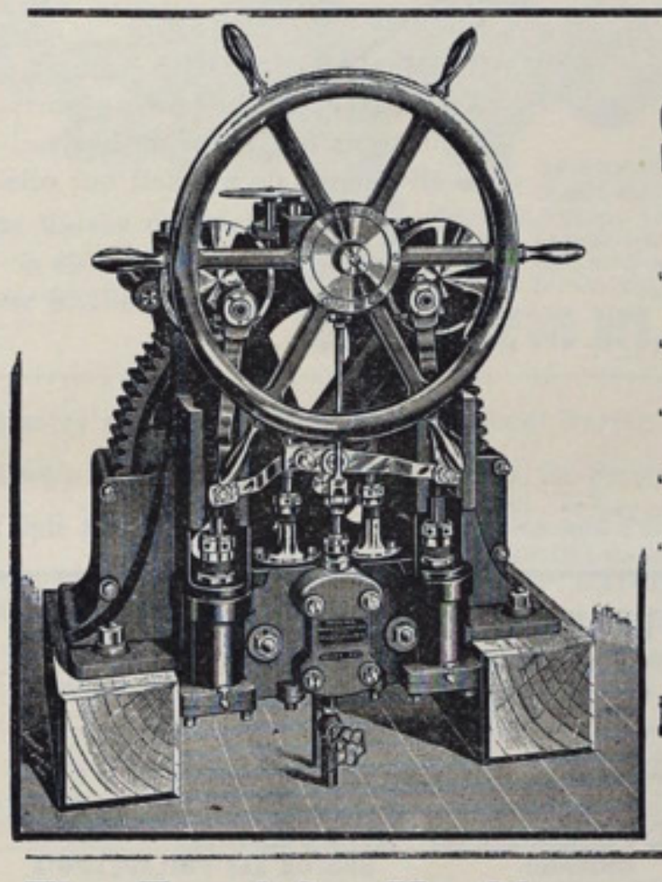
GO TO THE WORLD'S FAIR
WITH YOUR YACHT'S CREW UNIFORMED
BY

## FRANK G. OVERBEKE,

TAILOR AND OUTFITTER,

FINELY ILLUSTRATED CATALOGUE ON APPLICATION.

112 Woodland Ave., CLEVELAND, O.



## No. 4 BECK Steam Steering Gear.

Extracts from Letters.

"THE steering gears of the lakes."
*Capt. Higgie, V. O. T. Co., Chicago.*

"Cannot be excelled."
*Capt. Cochran, Steamer Marion.*

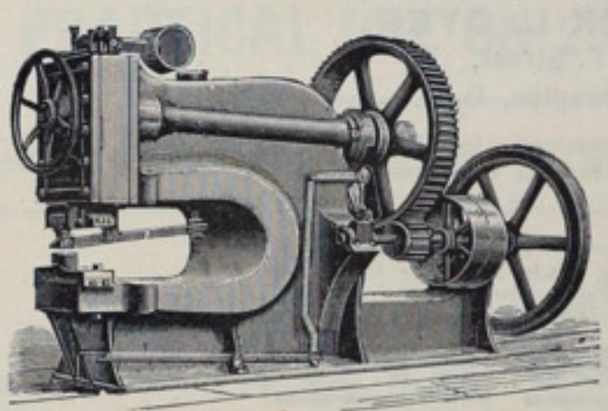
"Gives entire satisfaction."
*Independent Tug Line, Chicago.*

"Are giving excellent satisfaction."
*Milwaukee Dredge Co.*

"The No. 4 Beck Steering Gear put in our steamer, Samuel Mather, has given excellent satisfaction."
*W L. Mahon, Mech'l Eng'r, American Steel Barge Co.*

PAWLING & HARNISCHFEGER,
156-168 Clinton Street,
*MILWAUKEE, WIS.*

## The Excelsior Machine and Cleveland Punch and Shear Works Co.



SUCCESSORS TO
LEICHTON & HATHAWAY.
Manufacturers of

Punches, Shears, Bending Rolls, Rotary Planers, Overhead & Post Drill Presses.

980 to 986 Hamilton St.,
CLEVELAND, OHIO.


## MARINE REVIEW LINER EXCHANGE.

Space under this heading may be used gratis by our advertisers or subscribers to call attention to vessels or any craft, machinery, new or second hand, that they may have for sale. Those wanting machinery of any kind or wishing to purchase vessels, are invited to take advantage of the same offer. Employers in need of professional men or men who want positions may avail themselves of the opportunities offered. Each item will be limited to three lines. Letters concerning same must mention number attached to item and be addressed MARINE REVIEW, 516 Perry-Payne Building, Cleveland, O.

211—FOR SALE—Good scow that will carry 140 tons of coal.

212—FOR SALE—Steam pleasure yacht and two or three fish tugs.

213—FOR SALE—Three steam yachts. One 33, one 40 and one 90 feet long Good chance to buy cheap.

214—FOR SALE—Steamer M. M. Drake.

215—FOR SALE—Marine engine with 16-inch cylinder, complete.

216—FOR SALE—56-foot yacht with large cabins.

217—FOR SALE—Dredge Erie, two dumping scows, one float scow, two Ingersoll-Sargent rock drills etc.

# Spigot or Bung.

Buying an oil because it is cheap, so that the engineer can use lots of it—hit or miss—instead of buying an oil that may cost more per gallon but goes farther in using, is simply putting your lubrication upside down on the skids and drawing from the wrong end of the barrel—" saving at the spigot and letting run at the bung." Write us and we'll tell you how to tap your oil account so as to save at both spigot and bung.

VACUUM OIL CO.,
Rochester, N. Y.

VACUUM MARINE OILS
Are in stock at the leading ports.
Send to us for list of authorized Agents,
as all dealers do not sell our oils.

**TO THOSE INTERESTED IN, OR USING VALVES.**

We have recently made improvements in the manufacture of JENKINS BROS. VALVES, having increased the number of bolts, thickness of flanges, etc.
We shall manufacture ONE GRADE OF VALVE ONLY, suitable for high or low pressure steam.
The Jenkins Discs used in these valves are suitable for HIGH OR LOW PRESSURE. ☞ We guarantee all valves stamped with Trade Mark.

JENKINS BROS.,
NEW YORK. CHICAGO. BOSTON and PHILADELPHIA.

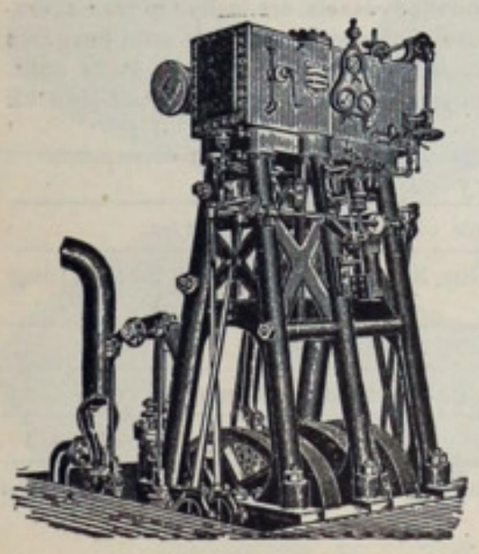
**PATENTS.**

**FRANK L. DYER,**
918 F. Street,
Washington, D. C.
References: American Steel Barge Co.;
Capt. Alexander McDougall.

**"ALL HANDS AFT."**

Let me get your Patent, Trade Mark, or Claim for you. Honest and Good work is my pride.

EDWARD C. WEAVER, Atty.,
900 F. (opp. Patent Office), WASHNGTON, D. C.



J. D. WILSON. M. HENDRIE.

**MONTAGUE IRON WORKS,**

*MONTAGUE, MICH.*

WILSON & HENDRIE, Proprietors.

MANUFACTURERS OF

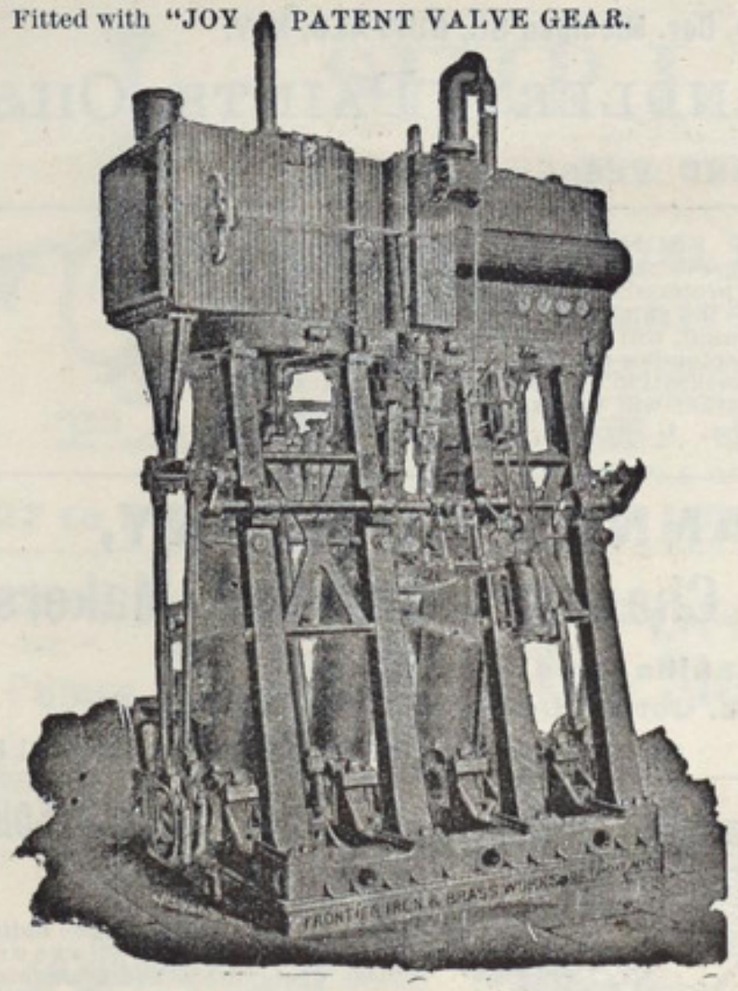
MARINE :: ENGINES :: AND :: BOILERS,

and General Mill Machinery.

**P. M. CHURCH & CO.,**
SAVINGS BANK BLOCK, SAULT STE. MARIE, MICH.
LEADING DEALERS IN
**Ship Chandlery,**
Marine Hardware, Paints, Oils, Packings, Cordage, Etc.
FIRST-CLASS COPPERSMITH AND TINSHOP IN CONNECTION.

**THE FRONTIER IRON WORKS.**

Fitted with "JOY" PATENT VALVE GEAR.



**DETROIT, MICH.,**
Builders of
TRIPLE EXPANSION
and all kinds of
Marine Engines

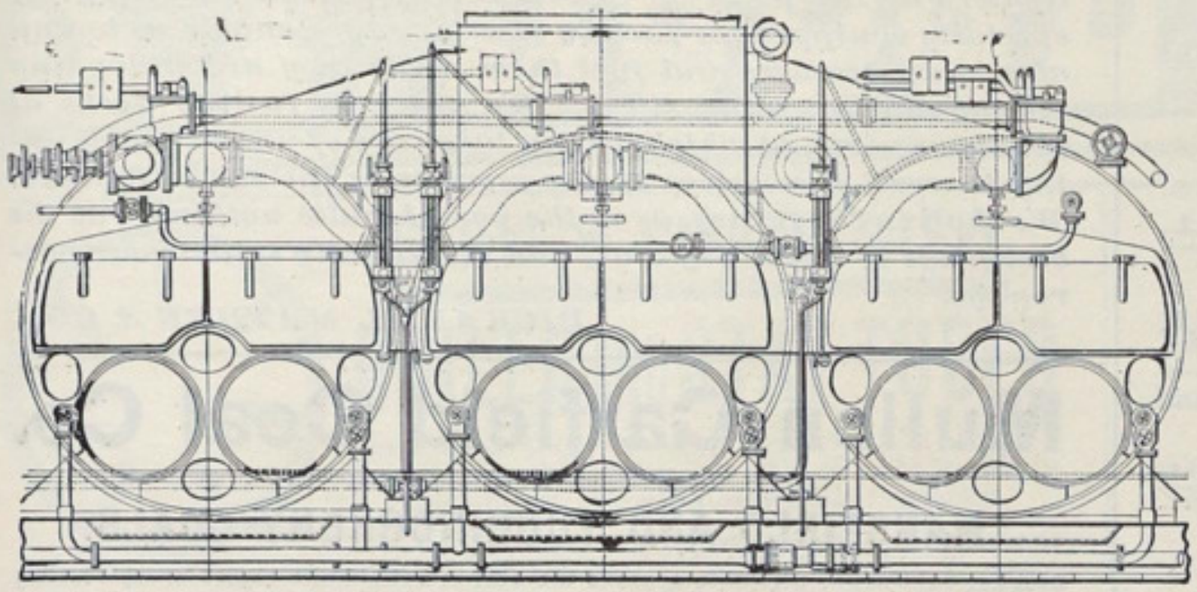
Engines furnished for Steamships:

T. W. Palmer, Livingstone, Majestic, Tampa, John Mitchell, Nyanza, Fedora, Geo. F. Williams, Mackinaw, Keweenaw, Jno. Harper, W. F. Sauber and Iosco.
Panther, (fore and compound).
Uganda, W. H. Gilbert, C. F. Bielman.

WHALEBACKS—
Samuel Mather, Pathfinder.

CORRECTED CHARTS OF THE ST. MARY'S RIVER CAN BE HAD FROM THE MARINE REVIEW, 516 PERRY-PAYNE BUILDING, CLEVELAND, O.

# LAKE ERIE BOILER WORKS, BUFFALO, N. Y.



## THE BEST EQUIPPED PLANT IN AMERICA

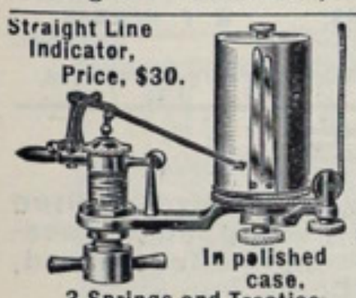
FOR THE MANUFACTURE OF

# MODERN MARINE BOILERS.

---

OWNERS AND CAPTAINS—If you want one of these handsome calenders mailed to you, send your address on a postal card, mentioning the REVIEW, to PARKER & MILLEN, Detroit, Mich.

---



Straight Line Indicator, Price, $30.

In polished case.

3 Springs and Treatise.

**STEP FORWARD** AND OWN AN **INDICATOR** and know how to to use it. Send for circular.

HINE & ROBERTSON, 40 Cortlandt St., N. Y.

He is using the best till he has tried **EUREKA PACKING** For Steam, Water and Air. Send for Sample.

**NO MAN CAN SAFELY SAY**

---

# T. S. & J. D. NEGUS

Have the largest and finest stock of Nautical Instruments and Charts in the United States.

Estimates given for

**Outfits of Steamers and Pleasure Yachts.**

**Compass Adjusters.**

Send for Catalogue and Almanac.

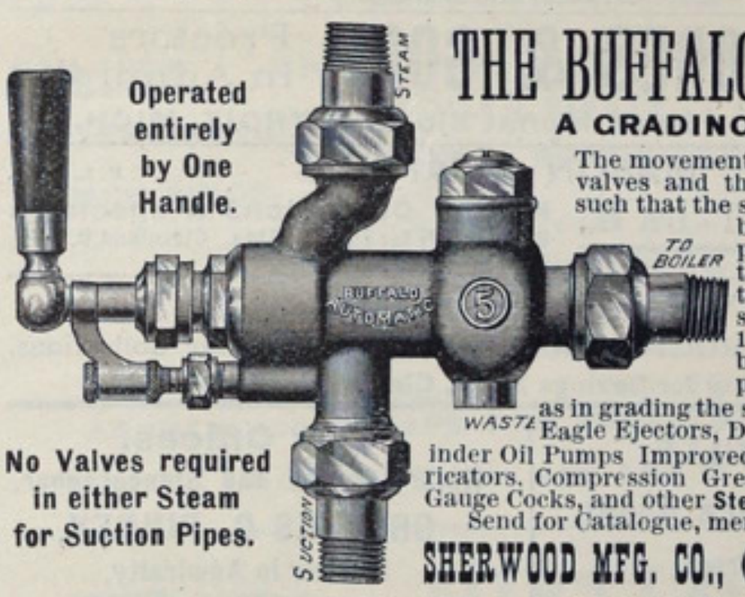
**140 Water St., New York City.**

Every attention given to Trade orders.

Try the new NEGUS LOG. Best in the World.

**Special Agents for the Celebrated Ritchie Compass.**

---




Operated entirely by One Handle.

No Valves required in either Steam for Suction Pipes.

# THE BUFFALO AUTOMATIC.

**A GRADING INJECTOR.**

The movement of the steam and water valves and their relative positions are such that the supply of water will always be in proportion to the supply of steam admitted to the jets. CAN BE GRADED to run continuously on any steam presssure from 20 to 140 lbs. Operated entirely by one handle, both in stopping and starting, as well as in grading the supply of steam and water. Eagle Ejectors, Duplex Tube Scrapers, Cylinder Oil Pumps Improved Glass Oil Cups and Lubricators. Compression Grease Cups, Improved Ball Gauge Cocks, and other **Steam Users' Specialties.**

Send for Catalogue, mentioning this paper.

**SHERWOOD MFG. CO., (Sole Mfrs.) BUFFALO, N. Y.**

---

**Ainsley's Engineers Manual of the Local Marine Board Examinations.**
Complete in 2 Vols.....$5.00

**Reed's Engineers Hand-book to the Marine Board Examinations.**
612 Pages, 36 Folding Plates, 8 vo. Cloth.....$4.50

**Triple and Quadruple Expansion Engines and Boilers and their Management.**
With 59 Illustrations, by A. RITCHIE LEASK.....$2.00

**How to Run Engines and Boilers.** By E. P. WATSON.....$1.50

**The Corliss Engine and Management.** By HENTHORNE & THURBER.....$1.00

**SPON & CHAMBERLAIN, Publishers, 10 Cortlandt St., N. Y.**

Illustrated and Descriptive Catalogue, 10 cents.

---

**No master trading to Lake Superior shouls be without a chart of the north shore. We have them for sale at $1 each.**

---

"The most perfect feed water heater and purifier we ever saw."—R. HAMMOND.

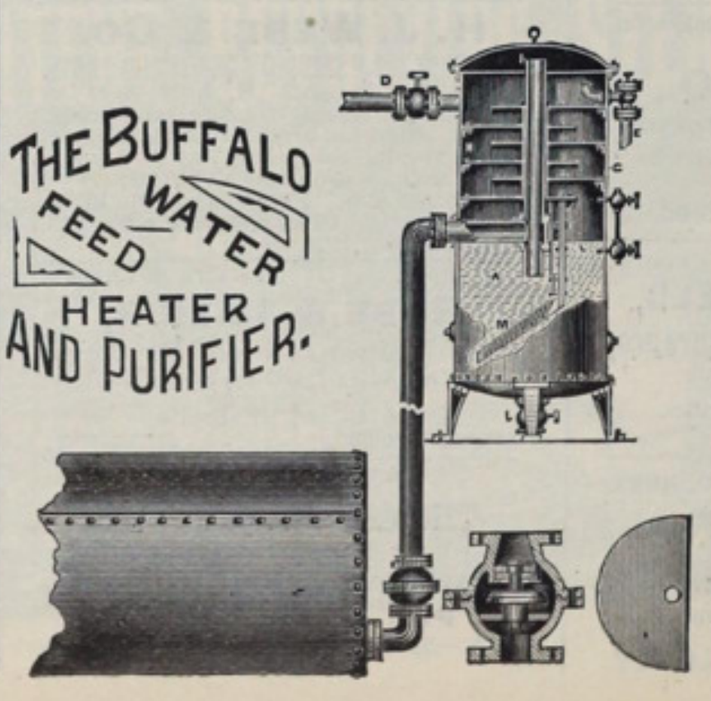
# IN PRACTICAL USE ON 25 LAKE STEAMERS.

**Every Purifier Warranted to Remove all Sediment or Scale-Forming Substance.**

## ROBERT LEARMONTH PATENTEE,

**200 BOUCK AVENUE, - - - - - BUFFALO, N. Y.**

THE BUFFALO FEED WATER HEATER AND PURIFIER.



REFERENCES.

A.—Settling chamber.
B.—Boiler.
C.—Feed pipe to boil
D.—Steam pipe.
E.—Water supply pipe.
F.—Check valve.
G.—Spray disks.
H.—Spray chamber.
I.—Equalizing tube.
J.—Blow-off pipe.
K.—Automatic shut-off valve.
L.—Division plate.
M.—Deflector and separator.

SHERMAN, HOYT & DUSTIN,
*LAWYERS AND PROCTORS IN ADMIRALTY.*
Western Reserve Building, Room 701 to 706, CLEVELAND, O.

HARVEY D. GOULDER,
LAWYER AND PROCTOR IN ADMIRALTY,
CLEVELAND, O.

W. H. COOK.
CAPT. J. A. CALBICK.
J. B. CLOUGH.
COOK, CALBICK & CO.
Vessel Agents and Underwriters.
Tel., Main, 56. RIALTO BLDG., No. 23 Sherman St., CHICAGO, ILL.

H. R. SPENCER,
*ATTORNEY AT LAW and PROCTOR IN ADMIRALTY.*
218 Superior St., DULUTH, MINN.

C. E. KREMER, *Attorney and Counselor-at-Law and Proctorin Admiralty.*
Rooms 14, 15 and 16, Bryan Block, - - 164 LA SALLE ST., CHICAGO. ILL.

JOHN MITCHELL. JOHN F. WEDOW. ALFRED MITCHELL.
MITCHELL & CO.,
Vessel and Insurance Agents,
508, 509 and 510 Perry-Payne Building, CLEVELAND, OHIO.
Office Telephone, 737. Reidence, John Mitchell, 3506.

WM. A. MOORE.
WM. V. MOORE.
JOHN H. GOFF.
MOORES & GOFF, Proctors in Admiralty
Telephone 2565. 60-61 Moffat Block, DETROIT, MICH.

H. C. MASON. MASON & TAFT, F. L. TAFT.
ATTORNEYS-AT-LAW, Marine Collections a specialty.
218 Society for Savings Bldg., Cleveland, O.
TELEPHONE 876.

WM. H. MILLER,
ATTORNEY AND PROCTOR IN ADMIRALTY. Marine Collections.
626 Society for Savings Bldg., Cleveland, Ohio.

JOHN PRINDIVILLE,
Vessel and Insurance Agent,
12 Sherman Street,
CHICAGO, ILL.
Telephone, Main, 129.

C. A. Macdonald. J. J. Rardon.
C. A. MACDONALD & CO.
General Insurance Agents,
RIALTO BUILDING, CHICAGO, ILL

H. S. LORD. J. H. NORTON.
LORD & NORTON,
*Attorneys-at-Law, Proctors and Advocates in Admiralty,*
*DULUTH, MINN.*

White, Johnson & McCaslin,
ATTORNEYS-AT-LAW,
—AND—
Proctors in Admiralty,
26-27 Blackstone Building,
CLEVELAND, - OHIO.

THOS. WILSON,
MANAGING OWNER
WILSON'S TRANSIT LINE.
Gen. Forwarder.
Freight and Vessel Agent.
CLEVELAND, O.

C. F. Palmer. Chas. Hutchinson.
P. J. Minch.
PALMER & CO.,
*Vessel Owners and Agents,*
(John H. Palmer and Jonn T. Hutchinson, Associates.)
Perry-Payne Bldg., Cleveland, O.

W. A. HAWGOOD. C. C. CANFIELD.
HAWGOOD & CANFIELD,
Vessel Agents and Marine Insurance,
604-605 Perry-Payne Bldg.,
Cleveland, - Ohio.
Telephone No. 2395.

Capt. LYMAN HUNT. JAMES P. HUNT.
L. HUNT & SON,
Vessel Brokerage & Marine Insurance,
Room 9, Exchange Building.
Telephone No. 522.
No. 202 Main St., BUFFALO, N.Y.

Law Offices.
Notary Public and Stenographer.
ORESTES C. PINNEY,
Proctor in Admiralty,
521 & 522 Perry-Payne Bldg.,
CLEVELAND, O.

W. L. Windom.
ATTORNEY-AT-LAW AND PROCTOR IN ADMIRALTY
Marine Notary.
ASHLAND, WIS.

C. W. ELPHICKE. A. L. FITCH.
JAS. A. MYERS.
C. W. ELPHICKE & CO.,
Vessel Owners and Agents,
Marine Underwriters,
Rooms 10, 11 and 12, Wheeler Block. 6 and 8 Sherman St. CHICAGO.
Telephone 1194.

E. T. HITCHCOCK,
Average Adjuster,
184 Main St.,
BUFFALO, N.Y.

Moore, Bartow & Gilchrist,
Ship Brokers & Agents,
Nos, 611 & 612 Perry-Payne Building,
Superior Street, Cleveland, O.

H. J. WEBB & CO.
SHIP BROKERS, VESSEL OWNERS and AGENTS,
Established in 1856. H. J. Webb & Co. will charter vessels for the lake trade. Special attention given to chartering vessels in the Lake Superior Iron Ore trade, both for the season and single trip.
☞No. 606 & 607 Perry-Payne Building, Cleveland, O. Office Telephone No. 338, Residence No 3228.

J. T. ROSE. FRANK B. LAZIER.
ROSE & LAZIER,
*Vessel Agents and Brokers, and Marine Insurance,*
16 Board of Trade,
DULUTH, - - MINN.

Established 1857.
THOMAS MARKS & CO.,
Merchants,
Forwarders and Shipowners,
Port Arthur, Canada.
N. B.—Special attention given to chartering vessels.

## To Owners and Masters of Steam Barges.

—:o:—

*We beg to call your attention to the fact that we have steam lighters at the ports of Cleveland, Ashtabula and Buffalo, specially equipped for fueling vessels, which enable us to run alongside steamers and fuel them while they are unloading during day or night time. We also have fueling docks at the above ports, at which we can take care of vessels not desiring to avail themselves of the services of the steam lighters. We shall in the future, as in the past, handle nothing but the best grade of Pittsburg coal, and respectfully solicit your patronage.*

*PICKANDS, MATHER & CO.*

## Mullen-Gatfield Coal Co.

— DEALERS IN THE CELEBRATED —

MANSFIELD AND YOUGHIOGHENY COALS.

Docks at SANDWICH, ONTARIO, opposite the Fort at Detroit, with chutes for rapid fueling.
Elevated docks and derrick at AMHERSTBURG, ONTARIO.

## THE CUDDY-MULLEN COAL CO.,

Dealers in COAL. Docks at Government Pier, Whiskey Island, and Adjoining Globe Dry Dock.

All fully equipped with Revolving Derricks; also, Lighter Carrying Derrick and One Hundred Two and One-Half Ton Buckets.
Main Office, 81 Perkins Building, East Side of Main Street Bridge.
Dock Office, 127 West River St., Cleveland, O. Telephone No. 8.
Boats Coaled Day and Night. Docks at Amherstburg,

## Ohio & Pennsylvania Coal Co.

FUEL DEPARTMENT.
MINERS AND SHIPPERS,

Youghiogheny and Ohio Steam Coals. Steamboats, Tugs, etc., Coaled day or night, DOCKS FOOT WEST RIVER STREET. WHISKEY ISLAND GOVERNMENT PIER and C. & P. R. R. SLIPS. Also STEAM LIGHTER—Equipped with Revolving Derrick and (100) two ton buckets.

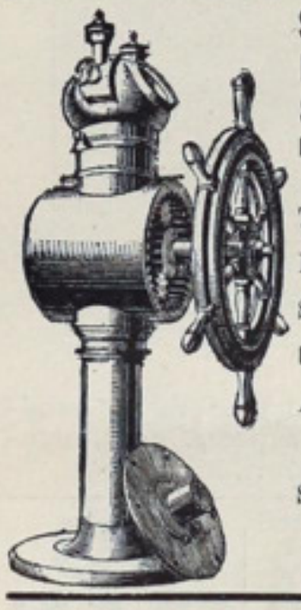
Telephone 1608. Office, 130 West River St., CLEVELAND, OHIO.

## THE HUBBARD COAL CO.

S. B. HUBBARD, Manager.

WHOLESALE COAL. JACKSON OUR SPECIALTY. STEAMERS COALED.

Office with R. B. Hubbard & Son, Wholesale Lumber,
*SANDUSKY, OHIO.*



SNELLING'S PATENT STEERER
For Steamers, Ships, Tugs, Yachts, Coal Barges, Etc.
The drum has powerful internal gearing.
No PURCHASE BLOCKS needed.
Simple as the common "wheel and drum."
Powerful as any Screw Steerer.
An excellent relief or auxiliary gear for vessels that steer by steam.
Send for Circular.
J. H. SNELLING,
158 South Street,
NEW YORK.

"Cleveland to Buffalo while you sleep."
Cleveland & Buffalo Transit Co.
Magnificent Side Wheel Steel Steamers.
"State of Ohio," and "State of New York."

DAILY TIME TABLE. (Sundays included.)
L've Cleve., 7:15 P.M. | L've Buff., 7:45 P.M.
Ar. Buffalo, 7:30 A.M. | Ar. Cleve., 8:00 A.M.
(Central Standard Time.)

Special Saturday Night Excursions to Niagara Falls.
☞Write for our tourist pamphlet.
H. R. ROGERS, Gen'l Pass. Agt. W. F. HERMAN, Gen'l Agt.
T. F. NEWMAN, Gen'l Mgr, Cleveland.

## FOR SALE.

STEAM YACHT MANATEE, formerly owned by Hamilton Disston of Philadelphia, 90x15x7. Fully equipped and seaworthy and in perfect order. No reasonable offer refused, and unreasonable offers considered. Come quick.
M. H. SCIPLE & CO., Philadelpaia, Pa.

British charts of Lake Superior cover the entire north shore. We have them for sale at $1.

H. A. BARR, PRESIDENT, Escanaba. F. H. VAN CLEVE, SEC. Escanaba. CAPT. GEO. BARTLEY, SUPT. Escanaba.
ESCANABA TOWING & WRECKING CO., Escanaba, Mich.
Tugs, Lighters, Steam Pumps, Hawsers, Hydraulic Jacks and Diving Appliances always ready.

TUG MONARCH, Engine Compound, Cylinder 16 and 30 inches diameter, 30 inch. Stroke, Steam Pressure Allowed, 125 pounds.
TUG DELTA, Cylinder 20 by 22, Steam Pressure Allowed, 105 pounds.
TUG OWEN, Cylinder 20 by 20, Steam Pressure Allowed, 104 pounds.
CENTRIFUGAL PUMPS, Seven and Fourteen Inch Suction.

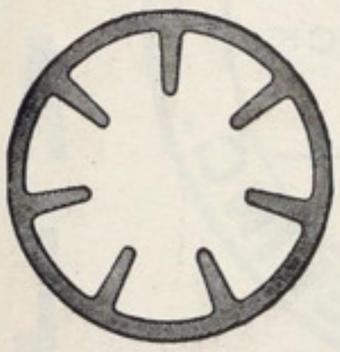
MECHANICAL DRAWING Taught by Mail,
Also, MECHANICS, *Mining, Prospecting, Arithmetic, etc.* To begin, students only need know how to read and write. DIPLOMAS Awarded. Low Prices. Send for FREE Circular to The Correspondence School of Mechanics, Scranton, Pa

# S. F. HODGE & CO.

MARINE ENGINES,
PROPELLER WHEELS,
DECK HOISTERS,
MARINE REPAIRS.

320 ATWATER STREET,
DETROIT, MICH.

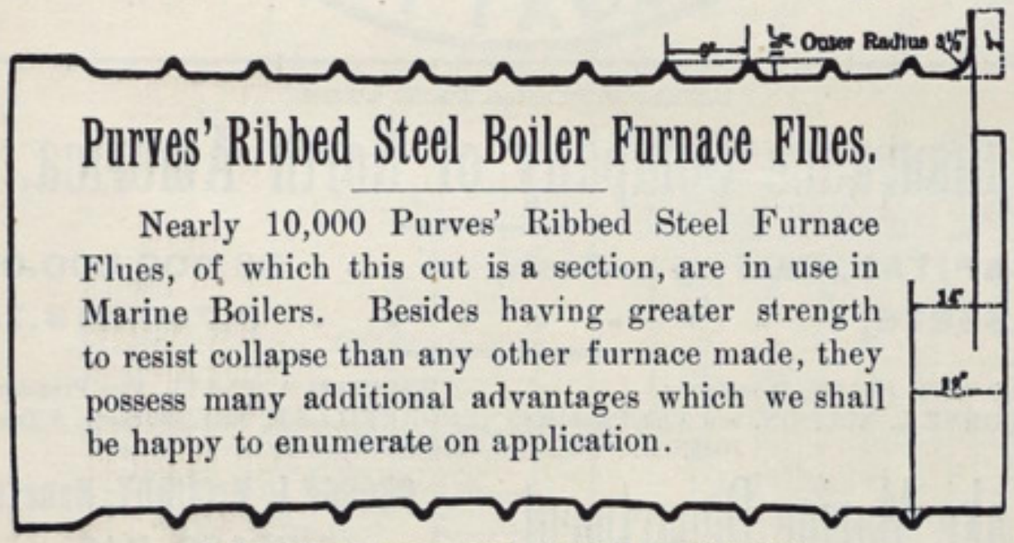
---



## SERVE'S RIBBED STEEL
## BOILER AND STAY TUBES

Show an average economy in fuel of 15 per cent. In steamers this means not only so much saving in cost of coal, but additional freight capacity.

☞Full Particulars on Application.




### Purves' Ribbed Steel Boiler Furnace Flues.

Nearly 10,000 Purves' Ribbed Steel Furnace Flues, of which this cut is a section, are in use in Marine Boilers. Besides having greater strength to resist collapse than any other furnace made, they possess many additional advantages which we shall be happy to enumerate on application.

**CHARLES W. WHITNEY,**

Representing Messrs. JOHN WILLIAMS & CO., Liverpool, sole agents for the U. S. and Canada.

**81 and 83 FULTON STREET, NEW YORK.**

---

## LIFE-SAVING MATTRESSES.

THE ONLY MATTRESS made that is essential for steamship use; fitted with life-cords, each mattress becomes a LIFE PRESERVER and will hold up twenty persons in the water. They are also especially adapted for Steamships, Yachts, etc., as they are always pure and clean, never need renovating, will not absorb moisture and cannot become infected with the germs of any contagious disease. Furthermore, they make the most comfortable bed in existence. Be sure you have your new vessels fitted entire with our goods. Write for catalogue and testimonial letters.

**IMPORTANT.—We have just received official notice from the U.S. Government, that ships having our AIR MATTRESSES can carry so many less Life Preservers.** Manufactured and sold only by

**METROPOLITAN AIR GOODS CO., 7 Temple Place, Boston, Mass.**

---

## ---HORACE SEE,---

CONSULTING ENGINEER AND NAVAL ARCHITECT,

ONE BROADWAY, NEW YORK.

---

## THE CONDIT FULLER CO.

**CLEVELAND, OHIO.**

**BAR IRON, SHEET IRON, PLATE IRON, PIG IRON,**
**BOILER TUBES, BOILER RIVETS, PLATE STEEL,**
**CLINCH RINGS, GAS PIPE, BOAT SPIKES, STEEL NAILS.**

Sales Agents of

**THE CARBON STEEL CO.**

Manufacturers of
OPEN HEARTH STEEL,
SHIP PLATES, BOILER PLATES,
ARCHES and STRAPS FOR VESSELS A SPECIALTY.

Write for Prices and List of Sizes.

---

ALSO ADAPTED FOR
**Iron and Steel Heating,**

For Hull and Boiler Plates, Tubes, Bending, Straightening and Laying Up Work.

## THE "WELLS LIGHT"

WALLWORK & WELLS' PATENTS.

**2000 CANDLE POWER!**

ESPECIALLY ADAPTED FOR

**Dry Docks and Night Loading.**

PORTABLE,
ENTIRELY SELF-CONTAINED,
REQUIRES NO OUTSIDE MOTIVE POWER,
UNAFFECTED BY WEATHER,
NO SPRAY, NO SMOKE, SAFE AND ECONOMICAL.
IN USE ON 15 DRY DOCKS ON THE LAKES.

☞For further particulars, address

**WILLIAM HALPIN,**

Successor to KEEGAN & HALPIN,

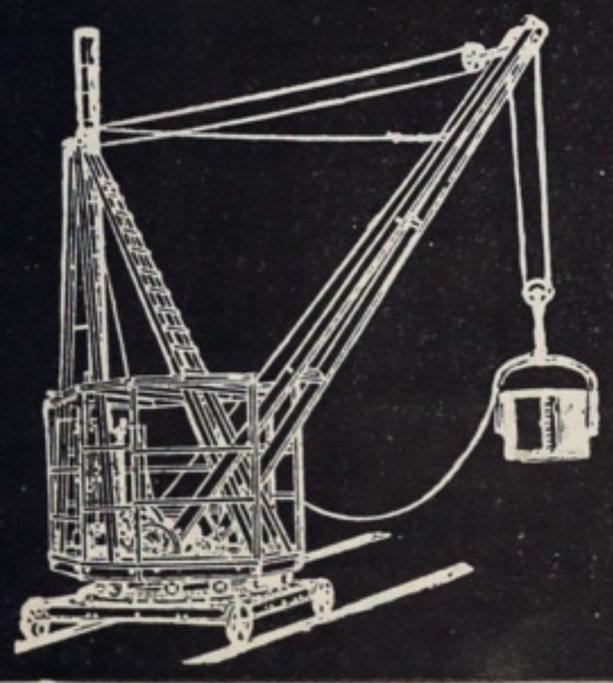
45 and 46 Washington St., NEW YORK.

---

## McMYLER MANUFACTURING CO., 180 COLUMBUS STREET, CLEVELAND, O.

SOLE MAKERS OF THE

## McMYLER PATENT REVOLVING STEAM DERRICK



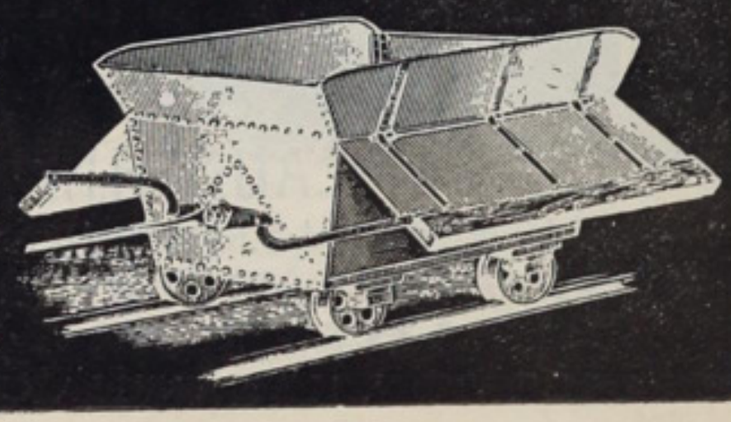
FOR HANDLING COAL, ORE AND COARSE FREIGHT OF ANY DESCRIPTION.

**This Derrick can Lift Load, Alter the Radius of Boom, Swing in Either Direction at Will of Operator, and can Propel Itself on Track any Desired Distance.**

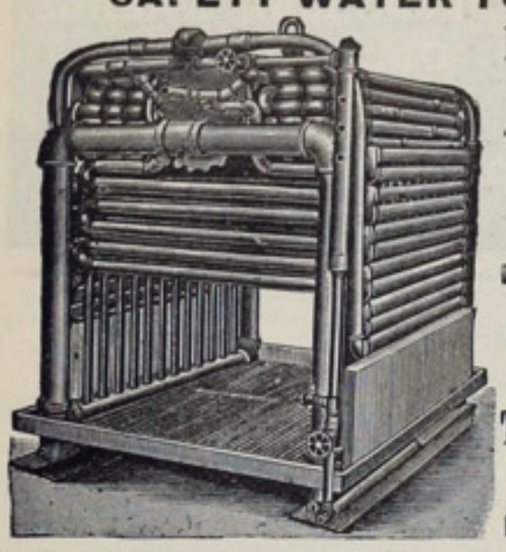
**BUILT FOR ANY CAPACITY WANTED**

BUILDERS OF

**CONVEYORS, COAL BUCKETS, ORE BUCKETS AND DUMP CARS.**



# THE ROBERTS
## SAFETY WATER TUBE MARINE BOILER,



For Yachts, Launches and other Steamers.

THE ORIGINAL FIXED WATER LINE PIPE BOILER

"Imitation the Sincerest Flattery." We are collecting royalties from the customers of many infringers.

**OVER 500 IN USE.**

☞SAFE, RELIABLE, SIMPLE, LIGHT WEIGHT, ECONOMICAL, NO SHOP REPAIRS, SMALL SPACE. Send for Illustrated Pamphlet and other reading matter, with hundreds of enthusiastic letters from purchasers and engineers.

**The Roberts Safety Water Tube Boiler Co.**

Works covering 12,000 sq. ft. of ground at RED BANK, N. J.

**18 Cortlandt Street, NEW YORK CITY.**

---

DAVID WHITNEY, JR., President. THE F. H. WHITNEY, Secretary

# MICHIGAN
## Fire and Marine Insurance Company,
DETROIT, MICH.

| | |
|---|---|
| *CASH CAPITAL,* | *$ 400,000.00* |
| *CASH ASSETS,* | *840,000.00* |
| *LOSSES PAID,* | *1,800,000.00* |

**THIS COMPANY DOES A GENERAL MARINE BUSINESS on the GREAT LAKES.**

**AGENTS AT ALL PRINCIPAL LAKE PORTS.**

---

# *The Martin-Barriss Co.*

IMPORTERS AND MANUFACTURERS OF

*Mahogany, White Mahogany,*

AND ALL NATIVE CABINET WOODS.

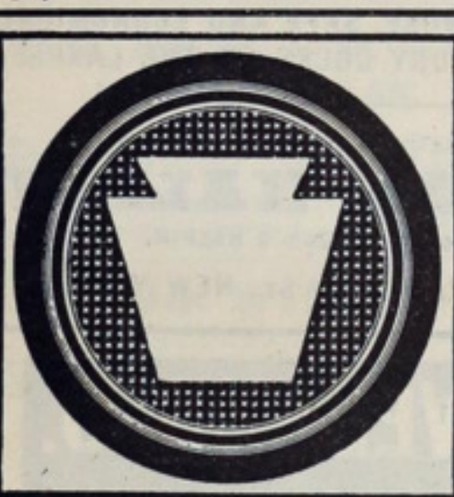
HIGH GRADES OF KILN DRIED WOODS FOR CABIN WORK AND INSIDE TRIM.

*White Oak Timbers and Plank*

CONSTANTLY ON HAND AND SAWED TO ORDER ON SHORT NOTICE.

*654 Seneca Street, Cleveland, Ohio.*

---



# ERIE RUBBER CO.
ERIE. PA.

Manufacturers of the

## KEYSTONE MARINE VALVE

*THESE*

***RED RUBBER VALVES***

*ARE THE*

**BEST AIR & FOOT VALVES MADE.**

IF YOUR DEALER DOES NOT KEEP THEM, WRITE DIRECT TO THE FACTORY.

---

# COAL

## STANLEY B. SMITH & CO. STEAMBOAT FUELING.

OPERATING

**SMITH'S COAL DOCK,**

**Detroit, Mich.**

**Pocket Fueling and Low Dock,**

—ALSO—

LORAIN COAL DOCK,

**Lorain, Ohio.**

LAKE SHIPPERS OF STEAMBOAT AND STEAM **COAL.**

# COAL

---

INCORPORATED 1794.

# Insurance Company of North America.

**CAPITAL, Paid up in Cash, - - $3,000,000.00**

**ASSETS, . - - - - - - - - 9,744,513.70**

CHARLES PLATT, President. WILLIAM A. PLATT, Vice-President.
EUGENE L. ELLISON, 2nd Vice-President. GREVILLE E. FRYER, Sec'y. & Treas.
JOHN H. ATWOOD, Assistant Secretary.

## Lake Marine Department.

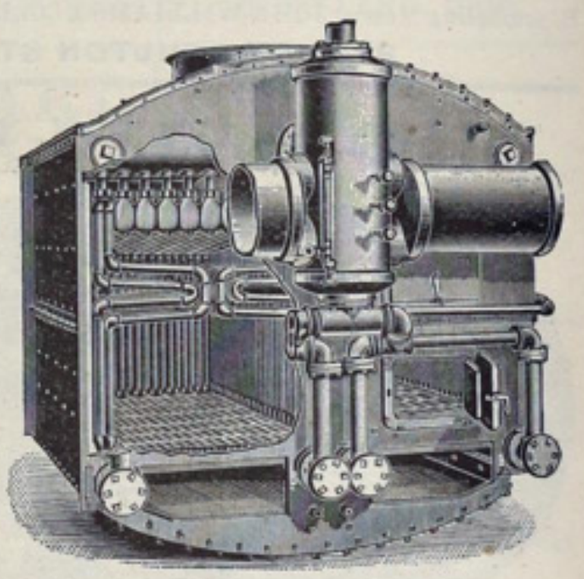
**GEORGE L. McCURDY, Manager.**
**CHICAGO, ILLS.**

---

## ALMY'S PATENT SECTIONAL WATER TUBE BOILER.

**The Most Efficient and Reliable Water Tube Boiler on the Market.**

**is neither a copy nor an infringement of any other Boiler.**



MANUFACTURED BY

**The Almy Water Tube Boiler Co.**

**No. 47 CLIFFORD STREET,**
**PROVIDENCE. R. I.**

---

## THE BEST PAINTS FOR IRON
ARE MADE BY

# W. W. LAWRENCE & CO.
PITTSBURGH, Pa.

**RED LEAD,**
**Red Lead & Lamp Black,**
**P. R. R. Red (iron oxide),**
**METALLIC REDS,**
**METALLIC BROWNS,**
**GRAPHITE PAINT,**
**IRON FILLER,**
**STEEL COLOR PAINT,**
**CARBON BLACK.**

☞CORRESPONDENCE SOLICITED.

---

# WARD BOILERS FOR STEAMERS LARGE OR SMALL

LIGHT WEIGHT, GREAT POWER

THREE TYPES

LAUNCH, NAVY AND MARINE.

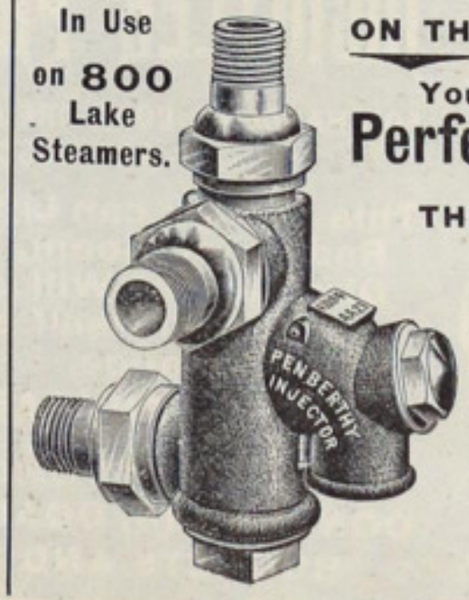
ADOPTED BY U.S. GOVERNMENT FOR WAR VESSELS, LAUNCHES, REVENUE CUTTERS, TUGS.

AFTER THE MOST EXHAUSTIVE COMPETITIVE TESTS. Correspondence Invited.

**CHARLES WARD,**
CHARLESTON, KANAWHA CO., W. VA.

---

In Use on 800 Lake Steamers.




ON THE LAKES **In Rough Weather**

You Want a

## Perfectly Automatic Injector.

THE **PENBERTHY**

Is the only one which will give you satisfaction.

SEND FOR CATALOGUE.

# PENBERTHY INJECTOR CO.
**Detroit, Mich.**

See our exhibit, Section 25, Mchy Hall, Worlds Fair.